

Special Feature: CAR OF THE YEAR

Radio Control

47380

July 1993

CAR ACTION

THE WORLD'S LEADING R/C CAR MAGAZINE

**Awesome
R/C Projects**

**Thunderdrome
Concours Winner**

**Super-Scale
NASCAR Bodies**

**Car of the
Future**

**King
of the
Hill**



**TAMIYA
Mountaineer**

**ON-ROAD
TORTURE TESTING:**

- Hyperdrive H10RS
- Tamiya Mercedes

USA \$3.95 CANADA \$4.50



NASTY NITRO

**Kyosho Off-Road
Gas Champs**

RACE TRUCK BUYERS' GUIDE

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On the cover: Tamiya Mountaineer.
(Photo by Louis DeFrancesco Jr.)

EDITORIAL

DUMB QUESTIONS

The "Isn't that cute, but does it work?" question

Every time I talk to someone unschooled in the ways of radio control, they ask this question: "Those little shocks don't actually *do* anything, do they?" I take a deep breath, regain my composure and retort, "Well, though the forces and stresses aren't directly proportionate, the suspension on a scale car performs the same tasks as that on a full-size car."

Obviously, these people didn't pay attention during physics. An object's size and mass affect the amount of force that acts on it, but a small object like a R/C car will be affected by gravity just like a full-size car; it will be slowed by wind resistance, and, if its wheel nut loosens, it will crash—just like your Uncle Koslof's Citroen.

Do you make any money at this?

Ya know, you come home after a long day at the track; and you're dirty, disgusted, and really not in the mood to deal with people, but they seek you out as you're unloading your gear.

"Wow! Look at all that expensive-looking stuff."

"What! Say that again. You spent *how* many hours at that race?"

"What do you get if you win?"

"A trophy?! That's it?"

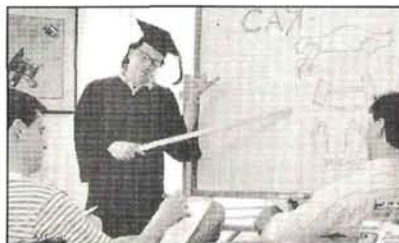
What do you say to this? What possible reply could you have?

"Look, go away! Yeah, I only get a stinkin' trophy. So what, that's not the point. I have fun. Fun, dammit!"

Doesn't this make you nuts? You and I know how much fun R/C racing is, but some people just don't seem to get it. I race because I enjoy it. Maybe on Sunday night, I'm a little burned-out, but by Monday—or Tuesday, at the latest—I'm ready to go again. And they can't seem to figure out the gratification aspect, either. First and foremost, racing is a hobby. Sure, there are some sponsored drivers out there, but forget about those guys; they don't have fun, anyway.

I'm a competitive person by nature, and racing R/C cars allows me to purge my system without breaking anything; I retired from motocross racing at the ripe old age of 15 after suffering numerous fractures, breaks and sprains.

All the money and time I spend R/C racing is well worth it. If I was in it for money, with the money I spend racing, I'd be better off buying lottery tickets and sitting at home in front of the tube, eating bonbons. Which would you rather be doing?



Professor Chiaheadi recently conducted a seminar in which *Car Action* staff members were instructed in the areas of quantum physics, astral projection and personal hygiene.

Frank Maslowski

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NEWS

This month, we interview Rich Sorensen—MRC's resident expert driver from southern California and a key member of World Scale's primary design team.

Q. Rich, which of MRC's World Scale vehicles do you find most exciting?

A. I race the Baja King. I like the pace of World Scale's aggressive Unlimited Class racing. The Baja King offers a "less electrics" version that saves a lot of money for me and for any other driver who doesn't want to use the standard motors or the mechanical speed controllers that are normally included in World Scale kits. World Scale trucks and buggies already come with the most important competitive features right in the box: four oil-filled, aluminum-bodied, coil-over shocks; slipper clutches; ball diffs; and even a light, aircraft-aluminum chassis. But the Baja King gives me a few extra advantages: sturdy turnbuckles built into every one of its steering and suspension rods, a full set of ball bearings and four of the highest-quality, low-profile tires you'll ever find.

Q. What modifications did you make to your own Unlimited Class Baja King?

A. Not many, really, since it doesn't take much to get the most from this truck. I used a pair of 16-turn motors with 13-tooth pinion gears, and I used diagonal cutters to cut the



dashes away from the front tires. I left the ribs in place on the tires, though, and I filled the fronts and rears with sponge foam. This helps

a lot. I use MRC's new 9.6V, C-cell "Juice Pak," too. Off-the-line punch is really excellent, and so are my top end and run times.

Q. For our readers who aren't yet involved in racing and who aren't familiar with some of its more technical terms, what, exactly, is a slipper clutch and what are its advantages?

A. Basically, a slipper clutch is a device that limits the amount of torque from the motor that reaches the transmission—it helps to prevent the car's diff from slipping so that it can do its job, and helps to make sure the rear tires stay hooked up with the track's surface. On high-traction surfaces where I usually race, I run my clutch and diff tighter so that I can pull the maximum acceleration out of my Baja King.

Well, we've run out of space again. Next time you visit your local hobby shop, don't forget to check out all three World Scale off-road trucks and buggies. You'll really like what you see.

LETTERS

WRITE TO US! We welcome your comments and suggestions. Letters should be addressed to "Letters," *Radio Control Car Action*, 251 Danbury Rd., Wilton, CT 06897. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

WORLD SCALE? WHERE?

Your magazine is my favorite! I recently started getting into R/C, and I bought a Tamiya Monster Beetle from a friend. I was thinking of buying a Desert Thunder (MRC's new World Scale buggy), but I can't find a place that sells them. I've tried all my local shops and all the major mail-order companies. I was wondering if MRC would sell me one right from the factory. I'm looking forward to your upcoming issues with World Scale reports.

TOM MACFARLANE
Hamden, CT

Sorry, Tom, MRC doesn't sell directly from the factory. But if you call them at (908) 248-0730, they'll be happy to tell you where you can buy World Scale vehicles.

Look for our review of the Desert Thunder in the next issue of Car Action.

LA

USE THE FORCE, LUKE

I've been reading your magazine for quite some time now. I remember reading a track report that you guys wrote on the Tamiya Top Force, but I can't find that issue. If you have a back issue, I would like to buy one. Plus, I was wondering if anybody makes a ball-bearing kit for the Top Force.

JASON DAUGHERTY
New Kensington, PA

Jason, we reviewed the Top Force in the October '92 issue of Car Action. You can order a back issue by calling 1-800-877-5169, or by writing to R/C Car Action Back Issues, P.O. Box 427, Mount Morris, IL 61054. They're \$4.50 each (\$5 outside the U.S.).

You might want to check out the latest

incarnation of the car—the Top Force Evolution—which was part of the "4WD Shootout" in our R/C Dirt Action special.

Tamiya makes a ball-bearing kit for the Top Force. Ask for it at your local hobby shop.

LA

CARB CONUNDRUM

I'm relatively new to the R/C hobby, and I enjoy reading your magazine regularly. Because of your reviews, I've purchased a Kyosho 1/10-scale gas Corvette, along with numerous other R/C products. I'm considering the purchase of either the TRC Python or the DuraTrax GT-10. A few questions have come up regarding gas power; I hope you can help me.

DuraTrax makes a host of high-performance goods for the .12 CZ-R. I bought the slide-valve carb, the finned, blue heat-sink head and the tuned pipe. I've noticed that the slide-valve carb is significantly smaller than the stock rotary carb. The advertisements for the carb kit state "better throttle response and improved power." I currently road-race a Kawasaki ZX7 motorcycle, and I know that carburetors with larger bores generally increase horsepower. How is it, then, that the smaller slide-valve can live up to its claim?

I've since removed the slide-valve carb and replaced it with the original rotary carburetor. I've noticed a dramatic improvement in the Kyosho's top-end speed. Is it just me, or what gives?

Also, could you explain the differences in AM, FM and PCM radios? I know it has to do with signal strength, but what else is involved? I want to know what the full options on these radios are.

Great magazine!

STEVEN NUNEZ
Bronx, NY

Your question about carburetors is very intuitive. Yes, generally, a carb with a larger bore will allow the engine to draw more fuel and air into the engine case, producing more power. It is not the case, however, with the slide-valve carb versus

the rotating carb. The rotating carb uses a spray bar to deliver the fuel into the throat of the bore, thereby reducing the overall volume of air it's able to draw. The slide carb uses a needle-valve system that withdraws from the car throat, leaving virtually nothing to obstruct the air flow. Although the slide-carb bore is somewhat smaller, the amount of air it draws may actually be comparable to the rotating carb. Slide carbs are also typically more responsive. Intake velocity—the speed at which the air is drawn into the engine case—could also be a factor.

As far as radios are concerned, the terms AM, FM and PCM really have nothing to do with signal strength, although the signal strength of each may be different. These are terms that refer to how the transmitter inputs are conveyed to the receiver. AM stands for Amplitude Modulation, which is the size of the radio wave that the transmitter emits. FM stands for Frequency Modulations, which is the number of radio waves that the transmitter emits. And PCM stands for Pulse Code Modulation, which is the type of digital code sent from the transmitter. Although AM transmitters are fine, they tend to react to some types of interference more readily. FM is somewhat less susceptible to the same types of interference. PCMs have the best record as far as interference, and although it's rumored that they can interfere with other FM radios, this has no basis in fact. Additionally, most FM and PCM radios have several features that many AM radios do not, so they're better for gas racing. There are many excellent radio manufacturers, but it's best to pick one brand and try to stay with it.

JB

CALM DOWN, MAN!

Aaaaaaaaaaammmmmggggggggghhhhhhhhhhhh! It's driving me crazy! Would you please tell me what "TQ" means? It keeps popping up in the "Kyosho World Challenge" race report in your January issue.

NICK CROSEN
Portland, ME

Top Qualifier.

JH

(Continued on page 175)

STORMER RACING

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SCH820	Ballraced steering lever set	39.95
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SCH1106	S15R, circlips, connecting rod	pair...2.25
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SCH1380	White shocks springs, medium M1.5	NEW
SCH1393	47 tooth clutch bell, Nitro Daytona	NEW
SCH1394	53 tooth clutch bell, Nitro Daytona	NEW
SCH1397	crank driver, use when pullstart is removed	NEW
SCH1398	Quick fill fuel tank, Nitro-10	NEW
SCH1399	2 speed gear change, Daytona	NEW
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SCH6543	Micro-spike, 26x39, 2.2 truck Green	14.95
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CAR Tires, these are pairs.

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SCH6532	Cat Rr tires, 8x10 Cut spikes, 2.2 car Green	9.95
SCH6535	Cat Rr tires, 22x34 Micro-spk, 2.2 car Blue	9.95
SCH6536	Cat Rr tires, 22x34 Micro-spk, 2.2 car Green	9.95
SCH6537	Cat Rr tires, 14x34 Micro-spk, 2.2 car Blue	8.95
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PATRIOTIC PORTRAIT

Landon Fraley, from Woodbridge, VA, sent us this photo of both his and his father's cars. Both cars sport patriotic symbols, because Landon was born on Veterans Day and his dad on the Fourth of July.



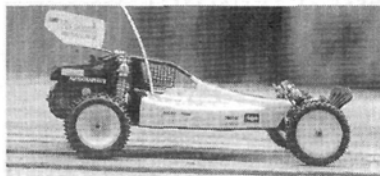
BRAND NEW

Keith Wieczorek says that when he bought this used Kyosho Ultima, it was "a piece of junk." He disassembled the entire car, cleaned it, and put it back together correctly. The car is equipped with an Airtronics ESC, and a Trinity Slot Machine motor is on the way. Keith's brother airbrushed the body.



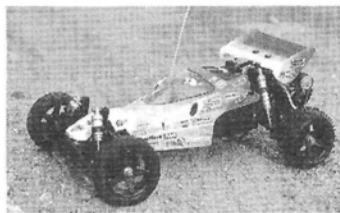
DIRTY DIABLO

Lonnie Mixell of Daytona Beach, FL, sent us this photo of his Kyosho Lamborghini Diablo. Underneath the body is a stock Le Mans motor, a Novak NER-2X receiver and a Novak T-4 ESC.



OLDIE BUT GOODIE

According to Rodney Littau from Jamaica, West Indies, this is one of the first RC10s, and it still keeps up with today's high-tech machinery on the track. Rodney says, "This car has no fear of heights, and it runs like an escaped convict."



COOKIE MONSTER

Jon Lee of New York, NY, decided to modify his Tamiya Madcap slightly. He replaced the stock mechanical speed controller with a Futaba MC112B ESC and replaced the original plastic shocks with DuraTrax Competition shocks. He also added HPI rims and Pro-Line tires.



CONVERSION VERSION

Blaine Mitten's LX-T began as a Junior T. It's equipped with a Losi 11-turn motor, a Tekin 411P ESC and an Airtronics Caliber 3P radio. Blaine recently added a Losi Hydra Drive and Losi's new Double XX tranny with MIP dogbones. To top it off, he also did the custom paint.

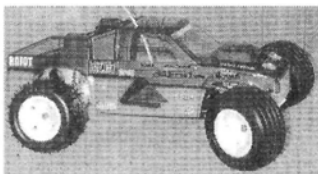


WOODS STALKER

David Chin's Kyosho USA-1 is controlled by a Futaba Attack, and it's decked out with DuraTrax long shocks, full ball bearings, working headlights and a custom-painted body. David—a technology/shop teacher in New York City—uses his truck to capture his students' attention.

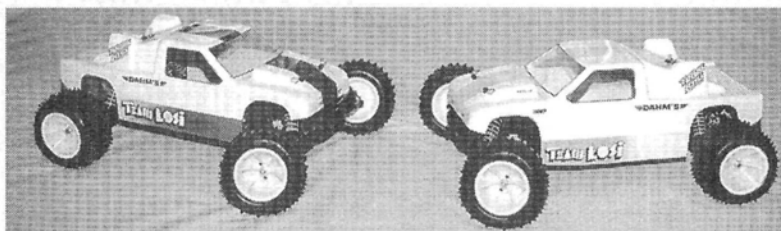
(Continued on page 12)

READERS' RIDES



SOUPED UP 'T

Mike Abel of San Ramon, CA, sent this photo of his tricked-out 10T. Mike uses a Novak speed controller, Composite Craft steering linkage, graphite shock towers and a graphite chassis. The truck is guided by a Futaba 2PD FM radio. Mike's friend painted the awesome body for him.



FAMILY TEAM

From the father and son team of Steve and Tyson Isley comes this pair of matching Losi LX-T's. The trucks are equipped with Tekin 411P ESCs, Futaba R120H receivers, Airtronics 94102 servos, Slot Machine motors, Litespeed heat sinks and connectors and Trinity matched and pushed SCR 1400 packs. Both are charged by a Tekin BC210 Reflex charger and are controlled by Magnum Jr.'s.



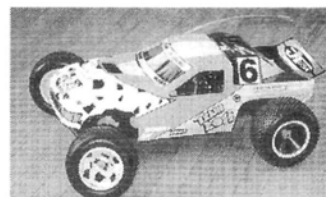
FLASHING LIGHTS

Paul Onorato of Ridgefield, CT, sent us so many good photos that it was difficult to choose just one. We finally settled on this one, since Paul scratch-built everything except the body (an MRP Monte Carlo with custom paint and lettering). Paul designed and built the working light bar, which flashes in realistic sequence.



SECOND LOOK

Alexander Sanchez from Union City, CA, sent this stunning photo of his RC10T. The 10T has a custom-painted S&K AIRS body, titanium hinge pins, turnbuckles and ball joints. He replaced all the hardware with aluminum pieces, and milled-out the chassis to reduce weight. It's powered by Stealth Batteries, an Extreme Motorsports Megatronic motor, a Novak M5 ESC and an Airtronics XL2P.



THE WILD SIDE

What a killer paint scheme! Eric Schoonover of Washington, IA, painted an Andy's body for his LX-T. For his local Stock racing series, he uses S&K 9-Series batteries with Badd Boyz and S&K Ironman motors. A Novak 410-M5, a Futaba Magnum Jr. and a Novak NER-2X receiver get the truck moving.



SHONEY'S L

Austin Henderson of Mt. Juliet, TN, added a Composite Craft oval chassis to his 10L. Other mods include titanium turnbuckles, Novak 610RV, Slot Machine motor, Trinity heat sink, SCRC Turbo cells and the new Associated independent-suspension front end.

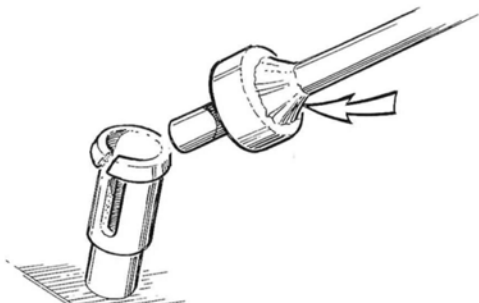
EVERYTHING ON IT

Kevin Meyer's 10LSS has *everything* on it: the new Associated front end, TRC tires, a Futaba 132H high-speed servo, a Tekin 410S ESC, a Composite Craft LTO SS Oval chassis, a Paragon titanium damper post, a T&A titanium axle and a Speedworks Green Machine with Trinity soft-cavity brushes. It's topped off with this custom-painted body.



PIT TIPS

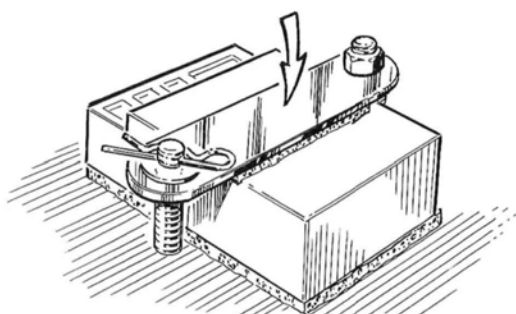
by JIM NEWMAN



TEAM LOSI ANTENNA SECURITY

Glue the antenna tube to the antenna-mount cap with CA, reinforce it with hot glue (arrowed), put the antenna wire back into the tube, then snap it into place on the mount. It *won't* fall off again!

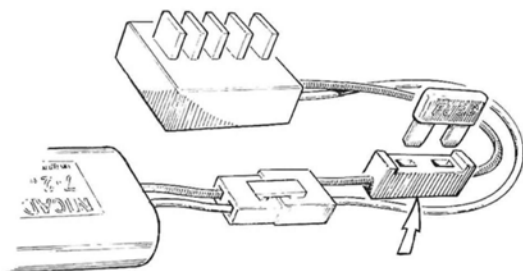
Ryan Copeland, Saskatoon, Saskatchewan, Canada



QUICK-CHANGE RECEIVERS

To install your receiver, drill the chassis and insert long screws, one of which has been cross-drilled. Next, cut a strip of Lexan® (arrowed), drill a hole in each end, then clamp it across the receiver with a nut at one end and a washer and body clip at the other. To remove the receiver, just pop off the clip and swing the Lexan® strip to one side. Foam rubber under the strip holds the radio securely and damps vibration.

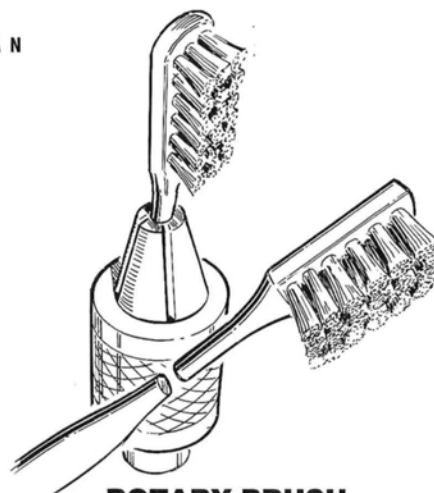
Aaron Blair, Flora Vista, NM



FUSE-PROTECTED CONTROLLERS

If your speed controller isn't fuse protected, here's how you can do it. Buy a fuse holder and fuses from an auto-parts store, cut the positive lead off the battery pack, then solder the fuse holder onto the cut lead. Ask the controller's manufacturer about the correct fuse value.

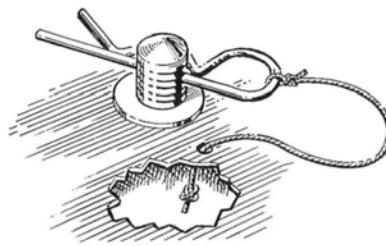
B. Le Huray, Channel Islands, UK



ROTARY BRUSH

To clean your car, cut an old toothbrush, as shown, mount it in your drill chuck, switch on the drill, and use the brush to remove dirt from those awkward crevices. Wear safety goggles!

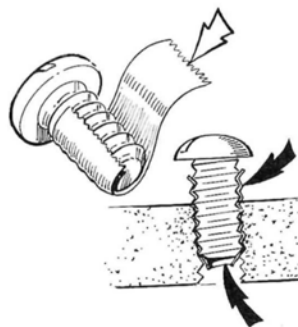
Josia Reichmuth, Hood River, OR



NO LOST BODY CLIPS

Here's an oldie but goodie. To avoid losing body clips, drill a small hole in the body near the mounting post, tie cord to the clip, thread the cord down through the hole and knot it on the inside. You'll never lose a clip again.

Duane Bailey, San Diego, CA



SCREW SECURITY

If your pinion screws are always working loose, wrap a small strip of plumbers' Teflon® pipe tape one-and-a-half turns around the thread of the screw, then screw it back into place. The threads are protected from being stripped, and the screw is easy to remove, but it won't loosen under load.

Miguel Suarez, Ricon de Echegaray, Mexico

Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 251 Danbury Rd. Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.



INSIDE SCOOP

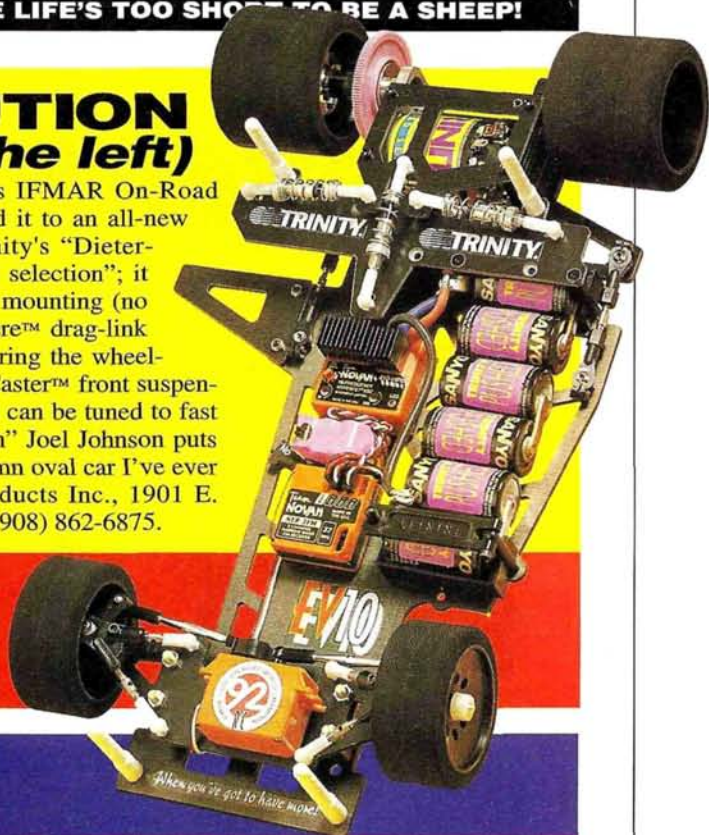
by CHRIS CHIANELLI



IN SEARCH OF FUN AND GLORY, 'CAUSE LIFE'S TOO SHORT TO BE A SHEEP!

EVOLUTION Takes a Turn (to the left)

Trinity has used the knowledge gained from its IFMAR On-Road Championship-winning Evolution 10 and applied it to an all-new oval car by burning the midnight R&D oil at Trinity's "Dieter-works." This car is definitely the product of "natural selection"; it has been designed to turn left! The adjustable battery mounting (no tape is needed) can be offset. Its adjustable Monosphere™ drag-link rear suspension reduces "scrub" on tight ovals by altering the wheel-base on one side. It also has unequal A-arm Reactive Caster™ front suspension and adjustable overall suspension, so the EV10SS can be tuned to fast superspeedways or shorter, tighter tracks. "Magic Man" Joel Johnson puts it this way, "All I can say is the EV10SS is the best damn oval car I've ever driven." For more information, contact Trinity Products Inc., 1901 E. Linden Ave., Linden, NY 07036; (908) 862-1705; fax (908) 862-6875.



Flash!

Evolution 10SS dominates the U.S. Oval Masters at Lake Whippoorwill and sets a new track record. See "Racer News" in this issue for details.



According to Robart Mfg., the new technology found in Snake Oil Lubricants will help deliver a deadly strike to the competition by increasing engine life and power. What is Snake Oil?—a whole new line of lubricants and metal treatments with advanced petrochemicals and SP-10 that, among other things, cut down on friction and the destructive

PREY ON THE COMPETITION

results of electro-catalytic corrosion. There are many products in the line, including Power Rev treatments for R/C engines and fuels, and Power Glide lubricants, consisting of bearing grease, oil additives and R/C Spray Lube. Watch for Snake Oil updates in the pages of *Car Action*. Contact: Robart Manufacturing P.O. Box 1247, St. Charles, IL 60174.

A true tenth-scale Indy Car

With all those great-looking, relatively inexpensive F1 cars coming out of Japan, it's a wonder it has taken so long but, finally, Great Planes Distributors has done something about it. You can now get the familiar Kyosho F1 chassis with a Ganassi Team Lola T3900 Indy body manufactured by Andy's Bodies. It's just like the one driven by '93 Indy 500 winner Arie Luyendyk. Rumor has it that this is just the beginning. Stay tuned.



BRAVO KYOSHO!

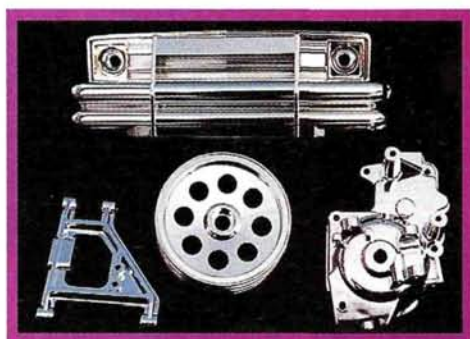
"TEAMING" WITH IMPROVEMENTS

Associated's new RC10T Team Truck (no. 7035) is bred for competition. The hop-ups that powered team drivers Brian Kinwald and Mark Pavidis to victory at the '92 ROAR Truck Nats, the '92 NORRCA Truck Nats and the '93 ROAR Winter Truck Champs now enhance this version of the RC10T.



Some of the new features are: universal/dogbone half-shafts; stronger shock towers with additional mounting positions; 0-degree rear hub carriers; 3-degree rear arm mounts; 30-degree caster blocks; Teflon shock pistons in three sizes; a graphite tranny brace; and new, one-piece wheels. For more information, contact: Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342, fax (714) 850-1744.

RC10T



BLINDING PERFORMANCE

While custom chrome-plating your R/C car or truck won't make it any faster, dazzling the competition to distraction is not an illegal tactic! So, if you're looking to make "glitter power" part of your race strategy, or if you're just looking to dress up your latest monster-truck creation, contact Robert at (608) 274-9811 (after 6 p.m. CST), or write to him at Chrome Tech USA, 2314 Ravenwood, Madison, WI 53711.

PROUD SPONSORS

Ken MacDowell (left) of Parma/PSE, and Gene Husting of Associated Electrics—two proud sponsors of the '93 IFMAR 1/10-scale Off-Road World Championships in London, England—cordially invite you to join them August 1 to 8 for a great week of R/C racing.

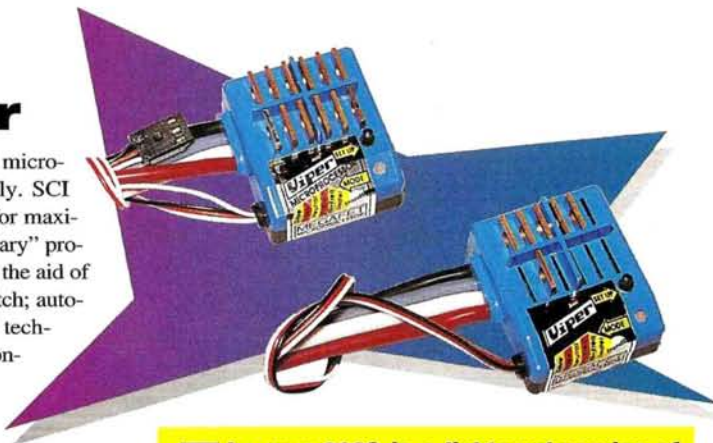


Richard's Rides

Motion Graphics, creator of those beautiful (and sometimes wild) custom-painted bodies, is now building complete custom R/C vehicles. Many of us don't have the time, skill, or patience to build a really first-class R/C car or truck, but Richard Muise (left) does! He will build and paint one to your specifications. Motion Graphics also has several ready-to-run vehicles in stock, so give him a call at (410) 848-0008, and be the envy of the track with one of Rich's rides.

Friendly Viper

SCI's new, 12 MegaFET, top-of-the-line Viper microprocessor speed controller is very user-friendly. SCI claims that it employs a single-chip microcomputer for maximum protection and ease of use. A sophisticated "rotary" program is controlled by the transmitter, and it's set with the aid of an LED on the ESC. Features are: a micro on/off switch; automatic standby mode; gold-plated connectors; SMD technology throughout; and brake limiting and torque control that can be adjusted on high-frequency mode. You won't need a computer course for this one. Contact SCI Airgate Station, Sarasota, FL 34278; (800) 673-9563.



NEW JR-XT-LJ (Long Jump Version)

Creative designer Austin Bailey, owner of Superior Hobby Supply in Champaign, IL, has created this prototype of the first flying race truck—the "Air Losi"—which is intended for stadium-type tracks with those big, high jumps. Mr.

Bailey has incorporated Sig Mid-Star wings with enlarged ailerons and a Kyosho Concept 30 helicopter tail boom into this racer, which is based on the Losi JR-XT racing truck. Rumor has it that much of the JR-XT-LJ's early

success comes from nature. The vehicle's airfoil has been highly modified to resemble that of the Indian Ocean Blue Flying Fish—also designed to be launched from high mounds; water though they be.



The new 933S is a lightened version of the two-time world champion BMT891. The 933 has all of the top performance features of the 891, but it now uses a new series of belts with 3mm pitch, giving the car even faster acceleration and higher speeds. This car is the same one used by the Italian BMT factory team, and it uses the latest in weight-saving technology. The rear axle, the wheel pins, the chassis, the engine mount and the radio plate have been redesigned and machined for lightness. The 933 also comes with BMT's new "Super Clutch" with five Metalox shoes.

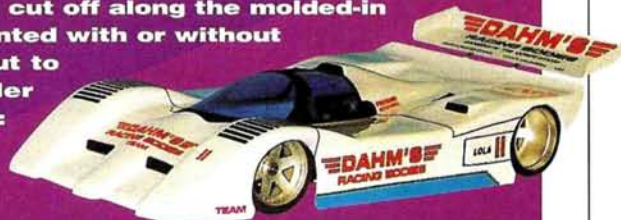
BMT 933S "AUSTIN LIGHT"

ERRATA: in our article "Top 10 Cars," which appeared in the May '93 issue, we may have accidentally given readers the impression that BMT suspension components are subject to heat distortion. The 933's suspension components—like those of the earlier 891—are also lightweight, fiberglass-reinforced nylon components that are almost never affected by heat or stress. For more information on the 933 series of BMT cars, contact Racer's Choice R/C Products Inc., 6N258 Acacia Lane, P.O. Box 405, Medinah, IL 60157; (708) 980-4863, fax (708) 980-5420.



Lola's Hot in the Curves

The new 1/10-scale Lola GT T92/10 from Dahm's Racing Bodies is designed to improve handling and increase top speed. This new standard-width, short-tail body features a molded-in spoiler that can be cut off along the molded-in trim line. The included GTP wing can be mounted with or without the spoiler. The molded-in vent can be cut out to direct cool air to the motor, speed controller and batteries. For more information, contact: Dahm's, P.O. Box 360, Cotati, CA 94931-0360; (707) 792-1316, fax (707) 792-0137. Send \$2 for a catalogue.



Radio Control
CAR ACTION

1993 Car of the Year



PHOTOS BY Jeff Bronstein

Blazin' Buggy



UNLESS YOU'VE BEEN living in a great wormhole in space, you know that gas-powered R/C cars and trucks are gaining forward momentum. It used to be that gas cars were only for hard-core enthusiasts, or for outer-fringe R/Cers who wanted something far and away from the norm. Not any more. Many manufacturers are jumping on the nitro bandwagon, and the competition is intense, to say the least.

The first Kyosho Gas Challenge races were sparsely attended, but the most recent race, in Hemet, CA (check out John Howell's article in this issue), reached its entry limit of 150 in a matter of days! In addition, the Hemet race attracted more spectators than anyone could have hoped for; it was standing-room-only at trackside.

Taking all this into account, is it any wonder that, for '93, we've chosen Kyosho's* gas-powered terror—the 1/8-scale Inferno—as our Car of the Year?

Kyosho Inferno



Yuichi Kanai (right), designer of the Kyosho Inferno, and Bill Jeric (left) of Hobbico and Kyosho USA.

KYOSHO'S KANAI

Have you ever wondered who designed the R/C cars that you drive today? Take the Kyosho Inferno, for example. Who would have thought of such a vehicle? Yuichi Kanai, that's who!

Kanai—who lives in a suburb of Tokyo, Japan—works in Kyosho's R&D/engineering department. His job is to take designs off the drawing board and make them a reality—in prototype form, of course. When the prototypes are ready for production, it's Kanai's responsibility to work with the production department to ensure that his designs are fulfilled. Kanai was instrumental in the design of the Inferno, which is Kyosho/Great Planes' best-selling 1/8-scale car to date.

As every off-road gas enthusiast should know, after the original Burns was released, it was updated to the popular Turbo Burns. When Kanai got a hold of the Turbo Burns, he redesigned it with performance and durability in mind. The brake system, the shocks, the overall suspension geometry and the fuel-tank placement (the tank was moved away from the delicate radio gear that could be damaged by spilled fuel) received Kanai's magic touch. Thus, the Inferno was born.

Not only did Kanai design the Inferno, but he also races one competitively. He has taken his Inferno to the winners' circle on a number of occasions, and he has won the Japanese 1/8-scale championship. Last summer, at the 1/8-Scale Off-Road Worlds in Germany, he placed sixth overall. And, most recently, Kanai placed second in the A-Main at Kyosho's gas race in Detroit, MI, and sixth in the A-Main at the Hemet, CA, gas race.

I wonder what's on Kanai's drafting table right now?



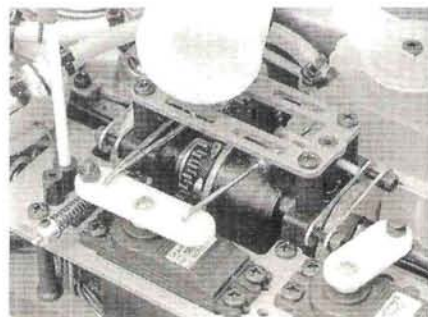
Inferno DX

Do you want to get into 1/8-scale gas off-road? Is your wallet making growling sounds like an empty stomach? Fear not, nitro-head; run—don't walk—down to the hobby shop, and check out the Inferno's little brother—the Inferno DX.

The Inferno DX is a "de-tuned" version of the Inferno. Its basic layout and suspension geometry are similar to those of the Inferno, but by including bushings instead of ball bearings, and molded-bodied shocks instead of the aluminum-bodied ones, Kyosho has built a competitive buggy that's priced within the reach of most nitro novices. And should you wish to burst upon the national racing scene, you'll find that the DX can be easily upgraded to Inferno status without major modifications.

SERIOUS TRACK RECORD

After its release in '91, the Inferno quickly became the dominant force on the racing scene. At the first Kyosho Gas Challenge race of '92, in Atlanta, GA, Jack Johnson led a 1-2 Inferno finish in the A-Main. In Detroit, MI, it was again an Inferno sweep of the top A-Main spots, with team driver Kris Moore emerging victorious from the grueling, 30-minute event. And, as if this wasn't enough, the Inferno ended the '92 race season by winning



For increased stopping power, a dual-disk braking system was designed for the Inferno. Both disks are attached to the center differential, and this makes setting and adjusting the brake linkage very easy.



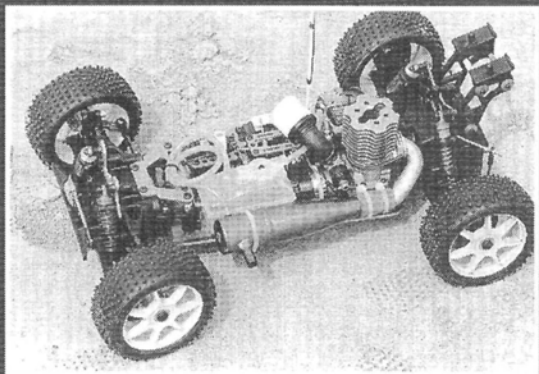
The Inferno comes with molded, one-piece, fluorescent wheels and the very popular BSW-40 tires. These tires have medium-length spikes and work well on most surfaces.

the IFMAR World Championship in Germany.

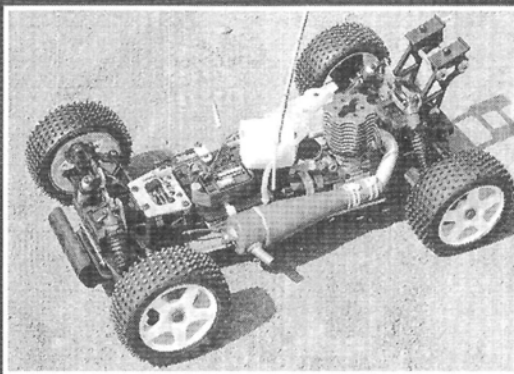
EVOLUTION OF A CHAMPION

Kyosho's Burns and Turbo Burns were very good cars, but the Inferno has taken 1/8-scale off-road to much higher levels of performance and reliability. Being fast on the track isn't enough to make a car successful; you have to be able to get

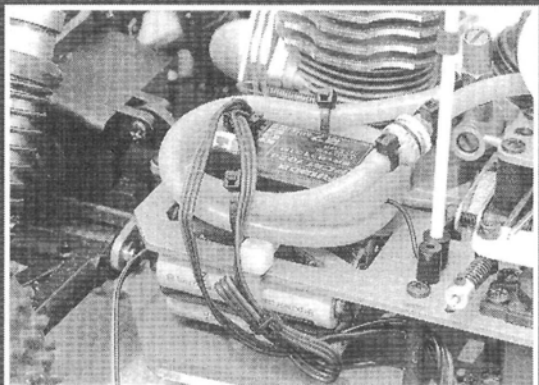
Inferno vs. Turbo Burns



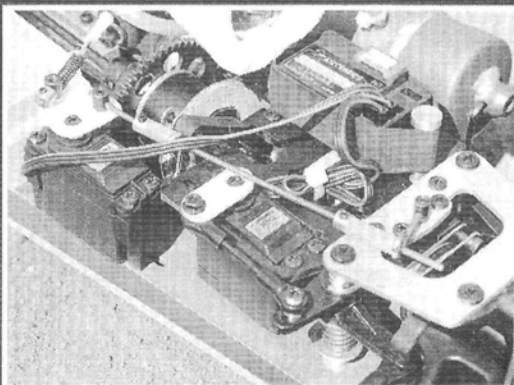
The Inferno is one of the easiest 1/8-scale buggies to maintain. All the car's major components are easily accessible and removable for quick cleaning.



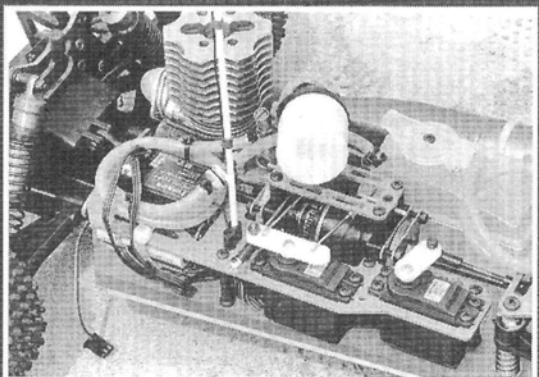
The Turbo Burns was a vast improvement over Kyosho's original Burns buggy, but it's not as easy to work on as the Inferno. Also, the large front bumper tended to dig in when the car landed off a jump, and this caused crashes.



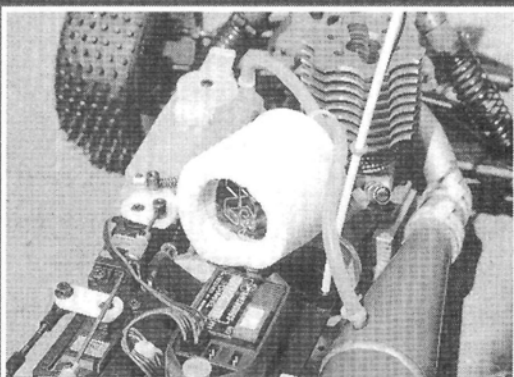
Take out four screws, and you can remove the Inferno's radio tray, which holds the steering servo, the throttle servo, the receiver and the batteries. In addition, the Inferno's dual-disk braking system provides much greater stopping power than the Turbo Burns' single-disk arrangement.



To adequately clean the Turbo Burns, you had to remove the steering servo/receiver tray, and then take out the throttle servo and its mounts. On the Inferno, these components are contained on one tray. The Inferno's radio tray also holds the steering servo more firmly, so steering response is more consistent.



On the Inferno, the receiver is mounted as far from the fuel tank as possible to prevent spilled fuel from causing damage.



The Inferno's throttle servo is mounted adjacent to its center diff and its brake disks, while the throttle servo on the Turbo Burns was slightly off-center, which required a more complicated linkage setup.

to the vital mechanics quickly and easily, and the Inferno delivers.

EASY MAINTENANCE

The Inferno's newly designed bulkheads allow quick access to the front and rear differentials,

so you can easily rebuild them, or repack them with lubricants of different viscosities if you're into experimenting with diff "loading." The easily removable, one-piece aluminum radio tray makes cleaning the car much more pleasant. By remov-

ing just four screws, you can lift out the entire tray—with the steering and throttle servos, the radio receiver, the antenna and the receiver battery pack—for a more thorough cleaning of the main chassis components.

(Continued on page 88)

What is Car of the Year?

The Oscars, the Emmys, and *Radio Control Car Action's* Car of the Year. These awards all have something in common: they represent the highest possible achievement in their respective fields. To be eligible to win the coveted Car of the Year trophy, candidates must meet the following criteria:

- must be widely available (through normal distribution channels)
- must give consumers good value for their money
- must have extensive manufacturer support (parts availability, technical assistance, etc.)
- must have a successful track record or impressive sales

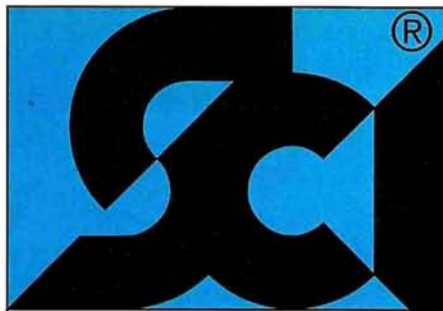
When choosing the Car of the Year, the *Car Action* editorial staff doesn't rely wholly on these factors, however. Reader mail and phone calls also weigh heavily in our decision-making. If many of you write in or call with positive comments about a car, we take this into consideration, too.

So, as you now know, *Car Action's* Car of the Year isn't chosen by a toss of the coin. A great deal of thought goes into every choice we make, and this makes the award that much more meaningful.

• • •

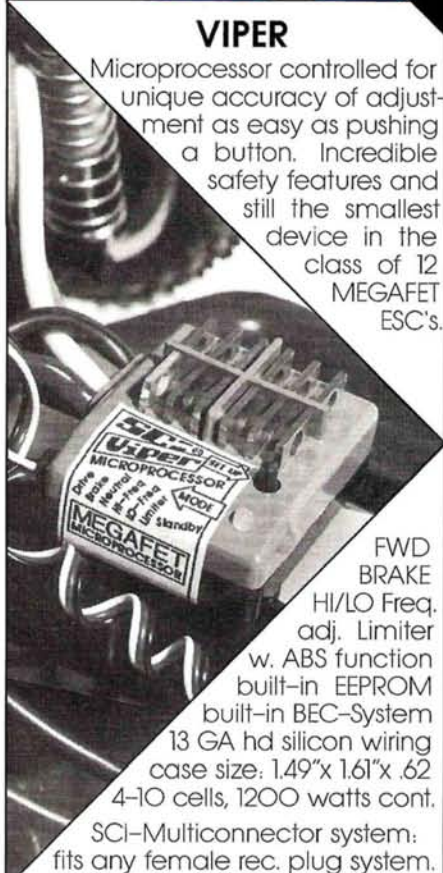
Past Car of the Year Winners

- 1988—Associated RC10
- 1989—Kyosho Turbo Optima Mid SE
- 1990—Losi JR-X2
- 1991—Losi Junior Two
- 1992—Associated Team Car



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Microprocessor controlled for unique accuracy of adjustment as easy as pushing a button. Incredible safety features and still the smallest device in the class of 12 MEGAFET ESC's.



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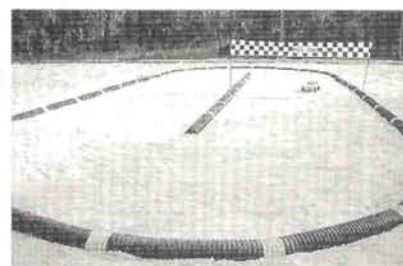
WHAT'S NEW

AMERICAN RACING PRODUCTS

Flex-Trac

ARP is the originator of the world's only universal, flexible, R/C track system. This revolutionary new system is for dirt, sand, mud and asphalt. It gives all R/C enthusiasts the pro racers' edge. Start today, in your own backyard, with a complete, oval-track set, and then enlarge your layout with one or more of the available expansion sets. Prices start at \$79.95 (layout shown).

ARP, P.O. Box 10364, Naples, FL 33941; (813) 592-6421.



PROTOFORM

Stealth Funny Car

This body is used by world champs such as Mike Ogle and Ron Goca. Sleek and beautiful, it's stable enough for

those 1.90-second ET runs at over 70mph. Designed to fit chassis with a wheelbase of 12.5 to 14 inches, it comes with the plastic you need to make a rear spoiler.

Part no.—1101; price—\$23.95.

Protoform, 537 Niagara St., St. Catharines, Ontario, Canada L2M 3P6; (416) 646-7638.

DIRT BAGZ

Roll-Up Tool Bagz

Do you need something to hold all the small tools that are so easy to lose? Look no further. A Dirt Bagz Roll-Up Tool Bagz can hold wheel

wrenches/nut drivers, Allen wrenches, X-Acto knives and body clips. Toss them into your Tool Bagz, fold it, then secure it with the Velcro® fastening.

Part no.—MH22; price—\$7.95.

Dirt Bagz USA, 200 1/2 Diamond Ave., Balboa Island, CA 92662; (714) 675-5810.



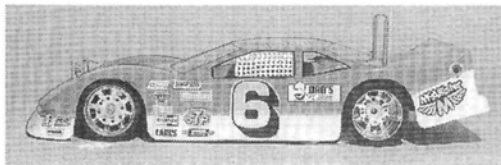
McALLISTER RACING

Short Track Stocker

McAllister Racing's new Short Track Stocker is the ultimate weapon for racing on short-track ovals. It's narrow enough to offer that aerodynamics advantage.

Part no.—B-168.

McAllister Racing, 100
N. Humphreys St.
#204, Flagstaff, AZ
86001; (602) 556-0665.



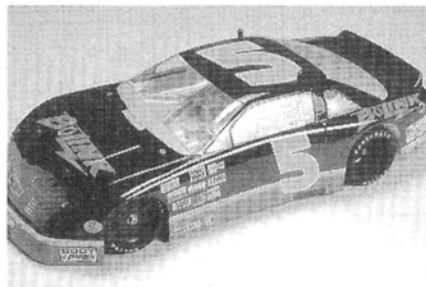
BOLINK

'93 Lumina

Bolink's '93 Short Track Lumina is patterned after the one that's run on short tracks across the U.S. every week.

Part nos.—BL-2305; BL-2306
(narrow); price—\$18.95.

Bolink R/C Cars, 420 Hosea
Rd., Lawrenceville, GA 30245;
(404) 963-0252.



COVERITE

Cobweb Spray Paints

These spray paints are specially formulated to splatter, so they offer unlimited possibilities for new, outrageous, head-turning paint schemes. Cobwebs can be sprayed on R/C cars, full-size autos, bicycles, skateboards, helmets, sneakers and T-shirts. They're available in neon pink, purple, neon green and black.

Price—\$6.95/6-ounce can.

Coverite, 420 Babylon Rd., Horsham, PA 19044; (215) 672-6720.



DAHM'S RACING BODIES

Firecat Thunderbody

Replace the dirt shields on your Dahm's Firecat body (part no. D055) with this 1/8-scale underbody and wing. The Firecat Thunderbody fits the Inferno, the Burns, the Pirate and most other

1/8-scale buggies. It protects the frame, strengthens the body, keeps out dirt and improves handling and aerodynamics. It comes with a separate wing.

Part no.—D052; price—\$16.98.

Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931-0360; (707) 792-1316.



TRINITY

HOT TIP!

Playing the Numbers

Once you've found the right tire/gear combination, keep it!

Racers often overlook the use of simple mathematics to help in selecting and maintaining a car's setup. When tire size changes during use, it affects not only the way your car handles, but also how your motor performs. The motor's final drive is a function of not just the pinion/spur ratio, but also of the size of the tire. When the tire wears, its diameter gets smaller; as the tire's diameter gets smaller, it won't travel as far each time it rotates. A tire with a diameter of 2.40 inches will drive the car forward 7.54 inches per axle rotation, but a tire that's 2.30 inches in diameter will only travel 7.22 inches per revolution—4.17 percent less distance.

The only way to maintain that total final drive is to adjust the ratio of the pinion/spur to compensate for the smaller tire. If you used a gear ratio of 5.00 (24/120), you would need to change it by 4.17 percent for the .10-inch-smaller tire. Your new ratio would be approximately 4.80 (25/120).



It's actually very easy. Just divide your present gear ratio by your old tire size, then multiply that result by your new tire size and, presto—out comes the gear ratio you need to run.

Example:

$$5.00/2.40=2.0833 \times 2.30=4.79$$

$$4.00/2.05=1.9512 \times 1.85=3.61$$

So use the percentages to your advantage.

Until next month,

Neal McCurdy
Trinity Team Manager

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The latest Blue Thunder fuel is 10 percent nitro, so it's a smart choice for sport gassers. A lower percentage of nitro means a lower price, so you spend less to burn up your backyard or local racetrack. A low-nitro fuel also helps to tame .12 to .21 engines and allows you to drive more consistently while puttin' down more power.

Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821; (217) 355-0022.

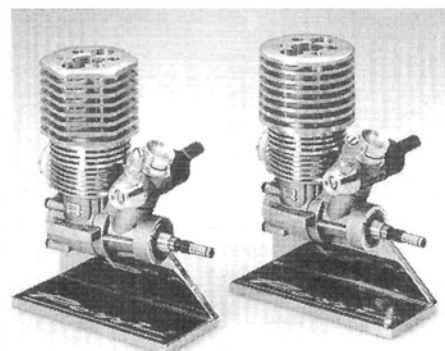
ITP

Rossi R21 Gold Head Engines

These powerful, state-of-the-art, six-port, Italian ABC engines have been winning races all over Europe. They're available in two versions: 34,000rpm/2.2hp for buggies; 36,000rpm/2hp for racing.

Part nos.—52R21 (buggy); 51R21 (racing); price—\$199.

ITP, 5621 Palmer Way, Ste. E, Carlsbad, CA 92008; (619) 431-7131.



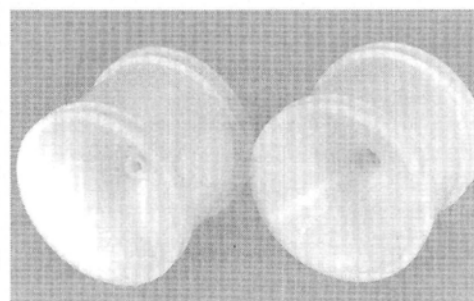
ASSOCIATED ELECTRICS

RC10T One-Piece Wheels

Team Associated now offers light, low-profile front and rear racing wheels for the RC10T.

Part nos.—7842 (front); 7802 (rear); price—\$7/pair.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342.



NOVAK ELECTRONICS

610-HRV Speed Controller

Team Novak's 610-HRV, high-frequency, digital speed controller provides ultra-smooth, proportional throttle control in forward and reverse. It features Hyperfet transistors (for the lowest "on" resistance and best performance in its class), high-frequency operation (for longer runs), adjustable reverse delay (from 0 to 3 seconds), thermal-shutdown circuitry (prevents overheating), and silicone-insulated wires to which the motor and battery plugs have already been attached.

Part no.—1800; price—\$165.

Novak Electronics, 18910 Teller Ave., Irvine, CA 92715; (714) 833-8873.



PARAGON

Aerodiscs

Keep mud out of your rims and make your car more aerodynamic with Aerodiscs. They come in 1/10- and 1/12-scale sizes and are made of a rigid, adhesive-backed vinyl that's easy to install.

Price—\$2.50/set of 8

Paragon Racing Products, 690 Industrial Cir., Shakopee MN 55379; (612) 496-0091.

PRO-LINE



Narrow Pontiac Body

This new, narrow, true-to-scale Pontiac body is racing past the competition in superspeedway races. The low-profile, aerodynamic body is made of durable, clear Lexan, and it fits the 10L and all other on-road chassis.

Part no.—3069; price—\$19.95.

Pro-Line USA, 201 W. Lincoln St., Banning, CA 92220; (909) 849-9781.

DAHM'S RACING BODIES



D050 New! LOLA Short Tail w/ Wing!
Super Low, Aerodynamic Race Winner!
D054 LOLA T92/10 Long Tail



D103PS - '93 Pro Stock TYPE T
Adjustable Wing - 4 Styles Available



D055 FIRECAT™ NEW! 8th Scale
Aerodynamic Dune Buggy Body & Wing
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D052 FIRECAT THUNDERBODY®
Improves handling & keeps dirt out!



D056 NEW! BUGGSY™ On LXT!
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D080 BUGGSY™ RC10T & USA-1



D197 COMMANDO™ Fits RC10T
Features Spoiler and Number Plates!
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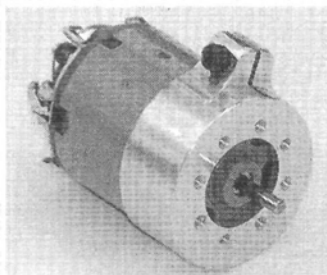
Imagine adding a popular, profitable—and returnable—hobby product to your store. By stocking *Model Airplane News*, *Radio Control Car Action*, the *Radio Control Action Series* and *Radio Control Boat Modeler*, you'll accomplish both! These are the most informative and entertaining modeling magazines available to the R/C consumer—and they're in tremendous demand. These magazines will actually stimulate more sales of R/C airplanes, cars, boats and accessories for you.



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WHAT'S NEW



INSIDE LINE

Quick-Change Motor Mount

This versatile quick-change motor mount was designed for endurance racing and will fit most pan cars. It allows your pit crew to change your car's motor in less than 20 seconds—with just a twist of a screw. Once the motor is slipped into

position and the clamp screw is tightened, the motor *won't* come loose. Machined from a solid bar of 2024-T4 aluminum, this motor mount has eight convenient mounting positions, and it weighs just over 1/4 ounce.

Part no.—3801; price—\$37.50

Inside Line, 12859 Rte. 108, Highland, MD 20777; (301) 854-2701.

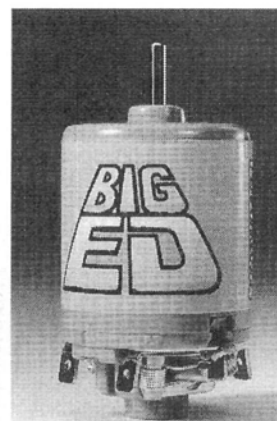
TEAM LOSI

Revolution Big Ed Stock Motor

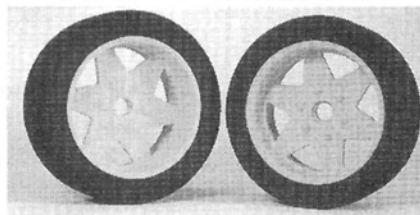
Team Losi proudly announces the release of its Big Ed—a 24-degree stock motor. This ROAR- and NORRCA-legal motor features the latest technology, including 5.0 wet magnets, a short-stack slotted armature and large, endbell solder tabs.

Part no.—TL-6028; price—\$28.

Team Losi, 13848 Magnolia Ave., Chino, CA 91710; (909) 465-9728.



T.M. RACING COMPONENTS



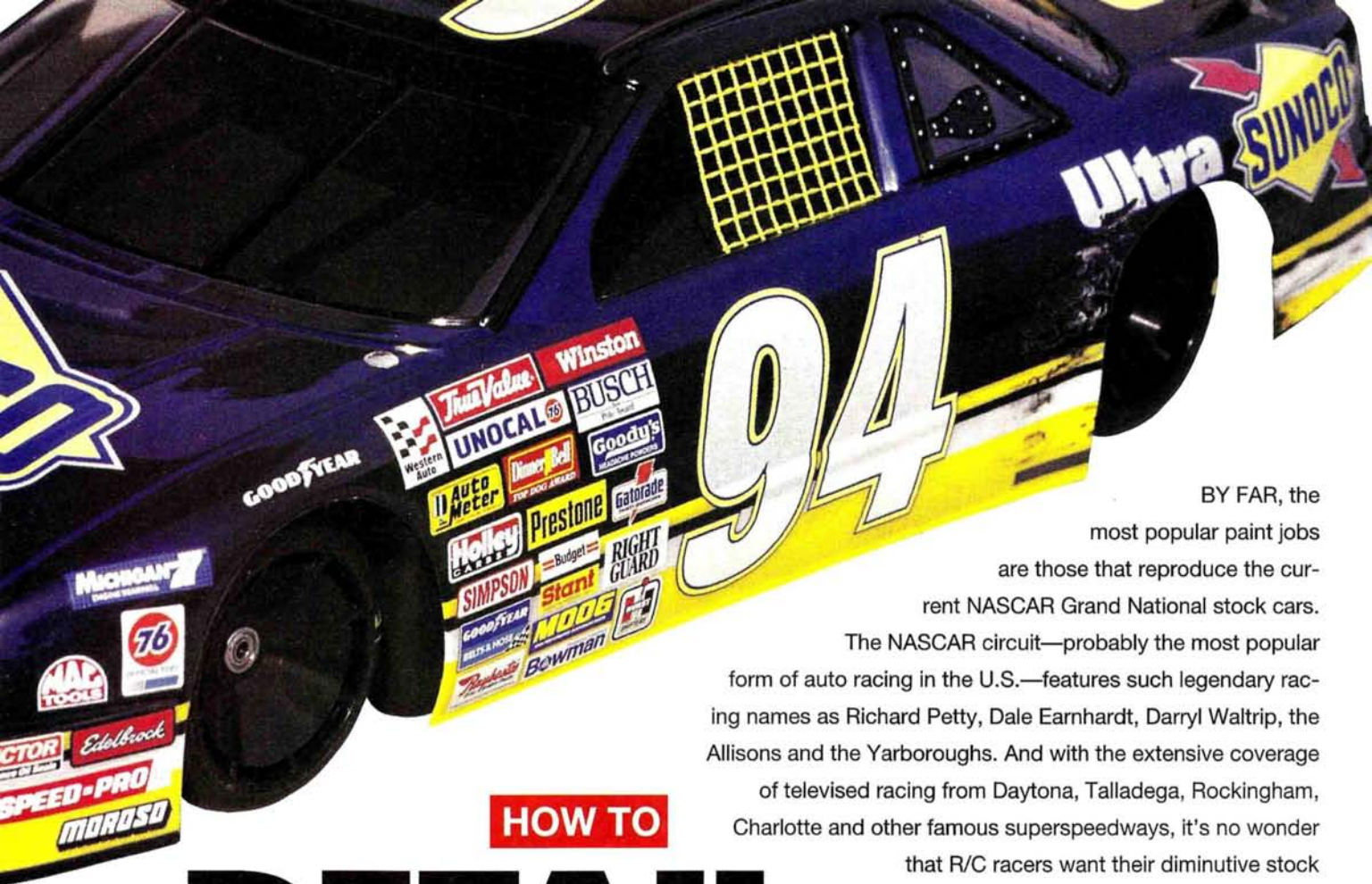
2.2-inch Truck Wheels

These new T.M. Racing 2.2-inch-diameter truck wheels for the RC10 and Losi trucks are molded of a super-tough nylon. The front wheels are 1 3/8 inches wide; the rears are 1 3/4 inches

wide; and they come with with T.M. green-dot tires already mounted.

T.M. Racing Components, 49679 Leona, Chesterfield, MI 48051; (313) 949-3506.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here doesn't constitute an endorsement by *Radio Control Car Action*, nor is it a guarantee of product performance or safety. When writing to the manufacturer about any product described here, be sure to say you read about it in *Radio Control Car Action*.



HOW TO

DETAIL NASCAR BODIES



1 I started this project with a complete package from Andy's R/C Products. It includes a painted body, sponsor decals and NASCAR "clusters" by Autographics. It's a real time-saver.

BY FAR, the most popular paint jobs are those that reproduce the current NASCAR Grand National stock cars.

The NASCAR circuit—probably the most popular form of auto racing in the U.S.—features such legendary racing names as Richard Petty, Dale Earnhardt, Darryl Waltrip, the Allisons and the Yarboroughs. And with the extensive coverage of televised racing from Daytona, Talladega, Rockingham, Charlotte and other famous superspeedways, it's no wonder

that R/C racers want their diminutive stock cars to emulate their full-size counterparts.

Fortunately, R/C car manufacturers have duplicated almost every type of stock-car

body that's used in NASCAR today.

Whether you want an Olds, a Chevy Lumina, a Pontiac, or a T-Bird, they've probably got you covered—usually in

the wide and narrow versions. In

fact, with a little hobby-shop browsing (one of my favorite pastimes), you should be able to come up with a ready-made set of realistic sponsor and number decals for your favorite NASCAR.

Autographics*, Parma* and Bolink* offer packages of authentic decals for Grand National cars, including the NASCAR "cluster" for the front fenders.

♦ PUTTIN' ON THE HITS ♦

by MIKE OGLE



2 Using denatured alcohol, remove all the overspray from the car. If you don't, those seemingly insignificant bumps of paint will show up when you put a decal over them.



4 For rivet detail, use a Pilot Silver marker, or a toothpick and some silver paint, which will last longer.



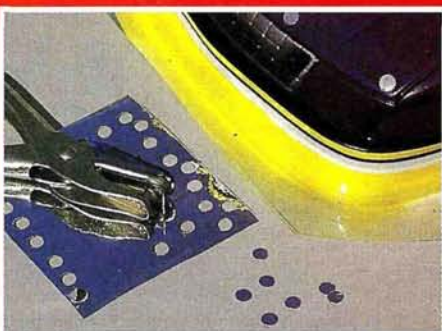
6 Prodeus Racing Products' window net looks very realistic in this open window. It's also effective on the inside of a window that doesn't already have a molded-in window net.



8 Use the decal's backing sheet to carefully position the decal. Note that the roof number always faces left (toward the track's infield) where the officials and pit crews are.



3 To paint the window moldings black, use a long-bristled brush.



5 You can make chrome bases for hood pins with chrome MonoKote and a paper punch. Make a bunch, because not all of them will come out well. Finish detailing them with a black fine-point marker.



7 To simulate a flexible rubber air dam, apply Pro Trim around the bottom edge of the chin spoiler.



9 A few drops of dishwashing soap in water allows you to position your decals before the adhesive dries.

PAINTING THE BASIC BODY COLORS

If you take a good look at the full-size cars on the circuit, you'll see that most of the paint schemes are actually pretty simple under all those decals. You should be able to reproduce 99 percent of them using masking tape and spray cans rather than an airbrush. (Yeah, we all know the exceptions, e.g., the Day-Glo "Tide" car). For the most part, the highly visible graphics of corporate sponsors are all that you'll see these days. When a company like Budweiser is paying the bills, you can bet your Clydesdale that the car will wind up a solid Bud red.

Every inch of space on a typical NASCAR body is bought by a sponsor. The front fenders, for example, always feature decals that are arranged in a certain hierarchy. Manufacturers have their decals shown in a designated spot—hence, the so-called NASCAR cluster of decals, which is basically the same on every car.

So, if you have the appropriate paint colors, start masking your windows first. Cover the whole window with a piece or two of 2-inch-wide masking tape, and trim it to the shape of the window by cutting around the window's inside edges with a no. 11 X-Acto knife. (You won't cut into the body if you use a sharp blade because only a slight amount of pressure is needed to cut the tape.) Mask off the colored areas of your paint scheme before you spray on the main body color, and make sure you back all your light colors with a coat of white paint before you spray on the darker colors, especially if you're using spray cans.

Of course, there is a shortcut. I picked up a NASCAR package from Andy's R/C Products* that includes a painted body, a set of high-quality Autographics sponsor decals and a set of NASCAR clusters. Andy's packages reproduce many of the most popular cars on the circuit. It's not that I'm lazy; it just saves me time and allows me to start the detailing sooner.

OUTSIDE PAINT DETAILS

When you've finished the basic paint scheme, clean any overspray from the outside of the body with denatured alcohol. Be sure to go over the body well, and remove *all* the overspray; a tiny dot of paint will create an unsightly lump when a decal is placed over it.

Now, using a small brush with long, soft, tapered bristles, paint all of the window moldings with black paint. This simulates the black areas of the full-size race cars where the windows are reinforced and bolted in, and it also covers the masked edges of the window where the paint may have bled under the masking tape.

Why do I specify a long, tapered brush?—because you can paint a much straighter line more easily with a long-bristled brush.

Pinstriping on a full-size car requires a brush with extremely long (4- to 6-inch) bristles that taper to a fine, sharp point. Think of it this way: if you were dragging a long rope across the sand, the rope would trace a straight line in the sand, even if your hand was a little shaky. A short-bristled brush will show every little tremor, and your windows will look as if they've been detailed by Foster Brooks. If you do goof, use denatured alcohol to wipe off the wet paint, and try again.

You can add the window-rivet detail with a Pilot fine-line silver marker or, if you have a steady hand, with a toothpick and some silver paint. As many of you who paint a lot of bodies know, Pactra's* silver paint is very difficult to brush on with any decent coverage; it looks more like metal flakes. I mix my own silver paint (for brushing, not spraying) using the clear, separated portion of Pactra's silver paint, and I mix it with the heavy, settled pigment from commercial aluminum paint. It works for me; it covers well and adheres to Lexan.

CHROME HOOD PINS

Here's a simple way to simulate the chrome hood pins used on most NASCAR bodies. Using a small sheet of self-adhesive chrome MonoKote* (other brands include Dahm's*, Autographics Trim Sheets, or Coverite's* Presto), punch out a bunch of circles with a paper hole-punch. Stick them over the molded-in pins, and detail them with little rivets and the pin section, drawn on with a fine-point black Sharpie or a Parma detailing pen.

WINDOW SAFETY NETTING

If the body you use comes with a molded-in window net, you can paint it from the outside (for a flat, cloth-like finish), or you can apply a decal like the one found on the Autographics sheet. Although these choices produce a pretty good effect when viewed from trackside, I wanted to go a step farther, so I cut out the driver's-side window of the car and bought a package of Prodeus Racing Products'* Pro Net, which is real, flexible netting that comes in a variety of colors. I chose yellow netting to accent the Sunoco color scheme, and after trimming the net to size, I mounted it in place with servo tape. Also included in the Prodeus package was rubber edging (called Pro Trim) that I used to line the front edge of the body. It simulates a flexi-



10 A low-wattage soldering iron can be used to simulate race damage. Those NASCAR guys are always swappin' paint!



11 Dry-brush the "damaged" area with black and then silver to make it look as if the paint has been scraped off the car's sheet-metal body.



12 Small strips of silver MonoKote simulate body-patching tape—the race car's version of a Band-Aid.



13 If you're good with an airbrush, you can realistically simulate road grime. Don't overdo it, or it will look as if your car has been "tagged" with graffiti.

ble rubber air dam and also protects the body from splitting.

DOOR LINES

If you're detailing a body with a dark color scheme, add the door lines with a black Sharpie or Parma detailing pen. Use a gray permanent marker when you detail a light-colored body. The semitransparent gray shades the door lines subtly, instead of overemphasizing them with a hard black line. It looks especially good on a white car; it's much more realistic.

TIPS FOR APPLYING DECALS

So, what's there to know about applying decals? Plenty! As I have mentioned before, make sure that all the overspray has been removed, and wipe the car thoroughly with denatured alcohol, or the decals won't stick. Also, wash your hands just before you start your decal job. Applying the decals is usually the last step, and I have applied many a decal only to find a "dirty" edge where the adhesive backing has picked up some paint or some dirt from my fingers.

You can trim the decal and lift it away from the backing sheet with an X-Acto knife, which leaves the backing sheet intact. This works best with very small decals. I use scissors to cut out the decal and backing sheet; then I peel them apart and use the slick backing sheet as a "holder" to position the decal before sticking it to the car. (Refer to the photos to get a better idea of how this works.)

Actually, the self-adhesive, sticky-backed vinyl transfers aren't true decals. Real decals, like those found in most scale-model car kits, have to be soaked in water to activate the adhesive, and they must be slid into place

before they dry. If you have a decal that's difficult to position, you can mix a few drops of liquid dishwashing soap with a small amount of water. (The soapy water doesn't affect the sticking power of the decal.) Separate the decal from its backing, and wet the area of the body where the decal will be applied. The soapy water lets you position the decal before it sticks. After the decal is in place, gently blot the water with a soft towel. This works especially well on large or intricate decals, and it also eliminates static electricity on larger decals.

Depending on where you place them, decals can wrinkle, e.g., on the hood of a

Volkswagen. To eliminate wrinkles, apply the decal as best as you can; then, with a sharp X-Acto knife, slice the decal from its center all the way out to the edge right along the wrinkle. With the decal in two pieces, it stays flat.

After the decal has been placed, burnish it thoroughly to eliminate that cloudy look where the adhesive isn't sticking. To avoid scratching the decal, burnish it with the discarded decal backing sheet, using the slick side on the decal.

RACE DAMAGE

Now you have a concours-ready body that's ready to hit the track. What more could you do to it to attract the judges' eyes? Well, this may sound like a demented idea, but how about adding a few dents to the fenders, and maybe some tire grime on the body, so that the car looks as if it has just finished a typical fender-bumping, 500-mile race? Come on, now; you want realism, don't you?

Here's how to do it. Heat a large metal cooking spoon over a low flame, and use it to apply "dents" to the car's fenders. A low-wattage soldering iron also works very well. Don't overdo it; just put a few dings on the fenders where another car could have made contact during a race. Brush some black paint on the edge of a business card, and use the card to "dry-brush" the damaged area. This will highlight the dent, and make it look as if another car's black tire smacked into your car. Finally, take the other edge of the business card and apply a little silver paint. When you lightly brush the surface a few times with the silver, it will look as if the paint has been scraped off, revealing the bare sheet metal. Now, doesn't that look cool?

You can take this "battle-damage" idea as far as you want. Cut out small strips of dull-silver MonoKote to simulate the ever-present "200mph tape" found somewhere on almost every race car as a quick-fix for body panels or a cracked spoiler. And, if you have an airbrush, you can simulate 1/10-scale road grunge and brake dust. The possibilities are endless! Your competitors will surely keep their distance if your car hits the starting grid already looking like a scene from the "Road Warriors"—especially the guys with the nice, shiny, new cars!

Here are the addresses of the companies mentioned in this article:

Autographics of California, 7401 White Ln. #1, Bakersfield, CA 93309.

Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, CA 30245.

Andy's R/C Products, 1710 Grevelia Ct., Ontario, CA 91761.

Pactra Inc., 620 Buckbee St., Rockford, IL 61104.

Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931.

Coverite, 420 Babylon Rd., Horsham, PA 19044.

Prodeus Racing Products, 2069 Temple Terrace, Jamul, CA 91935.

COBWEBS IN A CAN!

You won't believe your eyes.



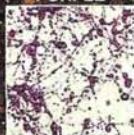
New from Coverite's BodyShop, Cobwebs are specially formulated aerosol spray paints that literally splatter right out of the can, allowing you to instantly create wild, California-style paint jobs! Cobwebs can be sprayed on R/C cars, planes, boats and helis, full-size autos, trucks, vans and hot rods, even bicycles, helmets, skateboards, sneakers and t-shirts. For unlimited variations and outrageous color schemes on Lexan® car bodies, BodyShop Cobwebs can be sprayed inside the body and backed with any color of BodyShop paints. One can of Cobwebs will last for several R/C car bodies. Richard Muise of Motion Graphics, America's premier R/C car painter says "No secrets or tricks - with BodyShop Cobwebs I can quickly create concours quality custom paint jobs without my airbrush - the possibilities are only limited by the imagination."

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Car Action TRACK REPORT



TAMIYA* HAS a history of making R/C trucks that generate a strong following. Thousands love their Clod Busters and Blackfoots (Blackfeet?) as much as their family pets. Now we have a new truck to love. Tamiya has resurrected the Bruiser—cosmetically modernized and

now called the Mountaineer.

The Mountaineer might be the best-looking, most realistic 1/10-scale truck ever built. It looks incredibly like a Toyota Hi-Lux 4x4. The body is too real for words. It's a perfect scale replica, right down to the door handles.

by STAN VanDRUFF

TAMIYA

4x4 *for real!*
MOUNT

The interior sports a full bench seat, a steering wheel and a dashboard with gauges and heater controls. A steel ladder frame supports everything, and an oversize, 750 motor supplies the power. A 3-speed transmission and a transfer case regulate the power, and U-jointed drive shafts are connected to the front and rear pumpkins. The only clue that this is a model is the on/off switch in the bed.

The chassis, transmission and suspension are of metal, and ball bearings are included for the four wheels (Oilite bushings are used everywhere else). Plastic is used only where it's truly advantageous, e.g., the body and the bumpers. Every part of the Mountaineer is topnotch.



PHOTOS BY STAN VANDRUFF

Applying the Finish

The hardest thing about building the Mountaineer was deciding how to paint it. It had to be special, but I wanted it to resemble a truck I could drive down the quiet streets in my hometown. That meant realistic and conservative, without the neon colors and wild graphics of a race truck.

I painted the whole body with Metalflake® Candy Apple® Lazer Blue metallic ground coat. The stripes are Candy Apple® Sea Green. Five coats of clear lacquer add gloss, but aren't brittle. I used a touch-up gun (a small spray gun, or big airbrush, depending on how you look at it!) for the base coats and the clear coats. I did most of the other work with an airbrush.

I sanded out the molding lines, then I scoured the body with abrasive cleanser to clean and de-gloss the surface. When the body had dried completely, I sprayed on three light coats of fast-dry lacquer primer. A fast-dry primer dries quickly enough so that it won't soften the plastic. When it's dry, it acts as a barrier to prevent the colors that are slower to dry from softening the plastic.

Candy Apple® paints are transparent and should be applied in many light coats. To prevent "banding," I spray odd-numbered coats along the length of the body and even-numbered coats across the body. The green is very transparent and will take on the color of

whatever is underneath. For a deep green, I sprayed six thin coats directly over the blue.

I painted the grill and the window trim with gray polycarbonate paint. (I mixed black and white.) If you put it on with several well-thinned coats, polycarbonate paint will have a nice, satin finish. The front and rear bumpers are of nylon, so I could dye them black. The side guards, on the other hand, are of styrene and won't accept dye, so I painted them with black lacquer.

I painted the front and rear lights and the side marker lights with Testors® Turn Signal Amber and Stoplight Red enamels. I had to thin the enamel with about two parts thinner for each one part of enamel for it to go through the airbrush.

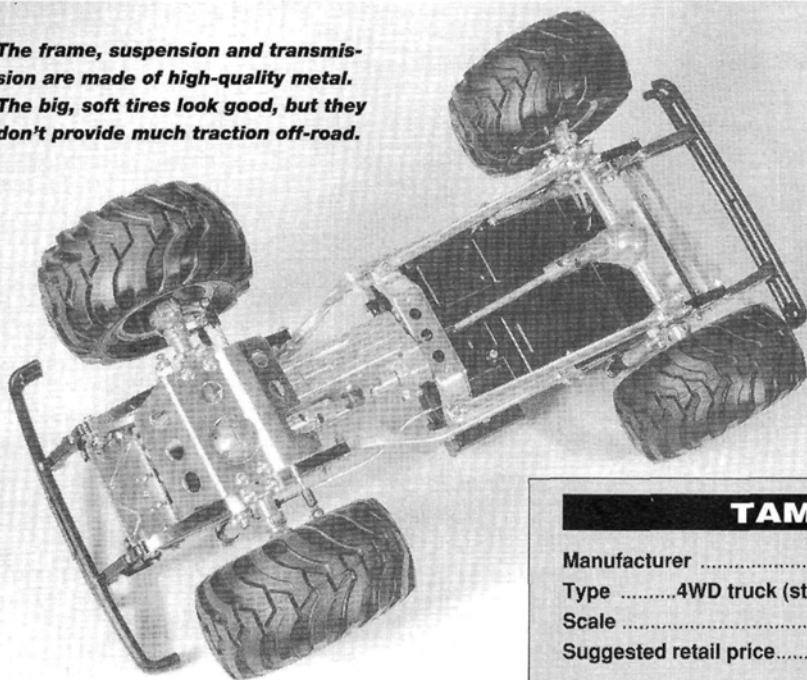
I painted the interior with dark metallic brown touch-up lacquer from an auto-parts store. When you look at the interior through the windshield, it looks as though the glass is tinted bronze. The door handles, locks, hinges and emblems were the only things that I painted with a brush; I used Testors silver enamel straight from the bottle.

My buddy Dave made the license plates with the cool Autographics® 10851 license-plate decal set. (He made the VA inspection sticker from some spare decals.)

It took me a week's worth of evenings to finish the Mountaineer, and I don't even want to think about how much all the paint cost! All I can say is that the Mountaineer is a rare kit that makes you want to go the extra mile to give it the finish it deserves.

AINNEER

The frame, suspension and transmission are made of high-quality metal. The big, soft tires look good, but they don't provide much traction off-road.



DOWN TO BUSINESS

If you've longed to work on a 4WD, and your dad wouldn't let you work on his, you'll love the Mountaineer. Tamiya's instructions are detailed, but they use a kind of shorthand that you should learn before you go very far. Each step is outlined with a box, and on one side is a list of each part you'll need. I almost missed it, but in fine print next to each part is the number of the bag that the part is in. For plastic parts, the tree number is given, and that number is clearly molded on the tree.

The kit is fairly easy to put together, though it does take a while. I won't go through it step by step, but I do have comments on a couple of areas. I guarantee that the metal chassis—even the tightest screws—will shake loose if you don't watch it. Be sure to apply thread lock everywhere that the instructions suggest.

On my kit, the front steering knuckles were stiff when the screws were tightened. To make them work smoothly, I took the knuckles apart, sanded the pivots slightly, and applied a drop of grease.

INSTALLING ELECTRONICS

To control the Mountaineer, you'll need a radio with at least three channels. (The third channel is used for the gearshift.) Tamiya recommends a 4-channel stick radio and gives you a pattern for a shift gate. It allows you to shift while in motion but prevents you from shifting with the throttle on (not a good idea). If you have only two channels, you can still have fun with the Mountaineer; you'll just have to lock the transmission in one gear.

Installing the electronics was a breeze. The linkages are already bent, and there's plenty of room to work. If you use an ESC with BEC, there will be enough room left on the chassis for a Walkman (or maybe a light and sound kit...hmmm...).

The kit includes a 3-speed forward/3-speed

reverse mechanical controller. Because I knew that I'd put in an ESC eventually, I didn't try the mechanical unit (I had only two servos, anyway). If you use an ESC, be sure to get one with reverse. Racing controllers don't have reverse, but, to get the most realism from the Mountaineer, you'll want it.

ON THE ROAD

While I waited for clear weather, I put several miles on the Mountaineer in my house. In low gear, it's safe to drive inside, but it will run over almost anything that gets in front of it.

Outside, it goes anywhere you take it. Its high ground clearance and 4WD allow it to run

TAMIYA MOUNTAINEER

ManufacturerTamiya
Type4WD truck (stand-off scale)
Scale1/40
Suggested retail price.....\$537.78

DIMENSIONS:

Overall length.....20.625 inches
Width.....10.75 inches
Wheelbase.....11.25 inches
Front track.....8.75 inches
Rear track.....9.25 inches

WEIGHT:

Gross (w/ battery)9 pounds, 3 ounces

BODY:

Type.....Toyota Hi-Lux
Material.....Polystyrene

CHASSIS:

Type.....Ladder frame
Material.....Cadmium-plated steel

DRIVE TRAIN:

PrimaryGears, gears, gears
Differential/frontOne-way wheel bearings
Differential/rear.....None
Bearings/bushings.....Oilite bushings and ball bearings

SUSPENSION:

Type (f/r)Leaf springs
Damping (f/r)Oil-filled shocks

WHEELS:

Front/rear: Type.....One-piece plated plastic
Dimensions (DxW)2.2 x 2.0 inches

TIRES:

Front/rearCleated "tractor" type

ELECTRICS:

MotorRS750
BatteryNone
Speed controllerNone

OPTIONS AS TESTED:

Futaba® Magnum PCM1024 3-channel radio with MC210CB ESC and two S9301 servos.



HITS

- Awesome engineering
- The chassis and body are so realistic they could fool a Toyota dealer
- Its 3-speed tranny and 4WD make this unique kit fun to drive anywhere
- It's very rugged and should last a long time.

MISSES

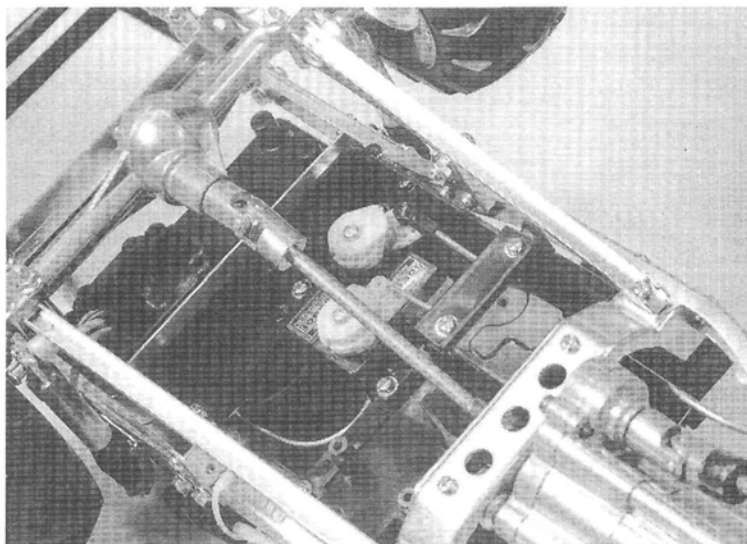
- The truck is top-heavy and its suspension is underdamped
- On high-bite surfaces, it flips easily
- The lack of a differential limits cornering ability
- A standard battery gives short run times owing to the truck's weight.

MOUNTAINEER

through the woods without getting caught up on leaves or fallen branches. (Note: 4WD only works in low gear, and because of the one-way bearings in the front wheels, there's no 4WD in reverse.) It climbs steep hills as long as the ground isn't too slippery; the stock tires don't provide the best traction.

I made several passes up and down my gravel driveway in high gear. The stiff, "under-damped" suspension made the Mountaineer tend to swap ends. But the real trouble came when I got to the end of my driveway and drove out onto the blacktop. The stock tires have excellent traction on asphalt. This, combined with a high center of gravity and a sharp turning radius, immediately spelled bad news for the paint job. I suppose a full-size truck would flip over, too, if I tried the same trick, wouldn't it? Next subject.

The only other problem occurred after I had run the truck for a while. After scaling



some steep hills, I lost reverse. Every time I tried reverse, it sounded like the gears were gnashing. I found the problem in the rear drive shaft. One U-joint on each drive shaft has a dogbone inside that allows the shaft to stretch when the suspension unloads. Leaf springs "wind up" and cause the drive shaft to stretch more in reverse than it does in forward. In reverse, the dogbone was slipping out. The solution: slide the U-joint on the transmission shaft just enough to engage the setscrew, and no further.

Just before I finished writing this, we had a few inches of snow. The Mountaineer begged me to take it outside and play, so I did. At first, it alternated between spinning out and getting stuck. But when I shifted to 4WD, it was a whole new game: in 4WD, it couldn't be stopped!

Though the Mountaineer has a high price tag, I'm sure it will attract a devoted follow-

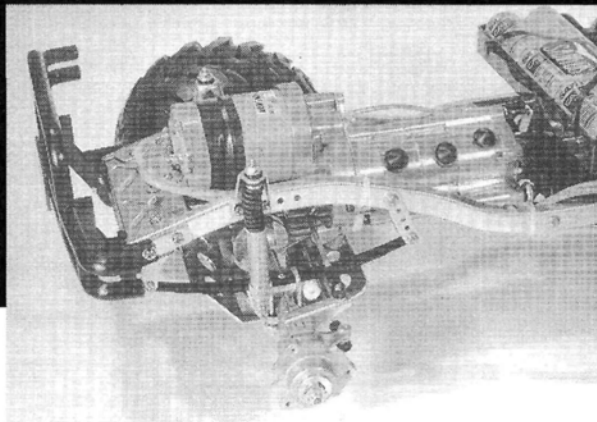
What's in there, anyway?

I'm terribly curious about anything mechanical, so I was disappointed that I didn't get to build the Mountaineer's transmission. The tranny comes assembled, but judging by the exploded drawing on the box lid, it's a good thing. The drawing isn't there to help you fix the transmission, but rather to deter people like me from tearing it apart to see what's inside. I wanted to open it up anyway to get a picture, but I lost my nerve.

When I talked to the folks at Tamiya, I heard a couple of horror stories about what happened to people who took the tranny apart. In short, if you take it apart, you might as well buy a new one! And, if you break something, Tamiya doesn't sell any tranny parts separately: it's all or nothing.

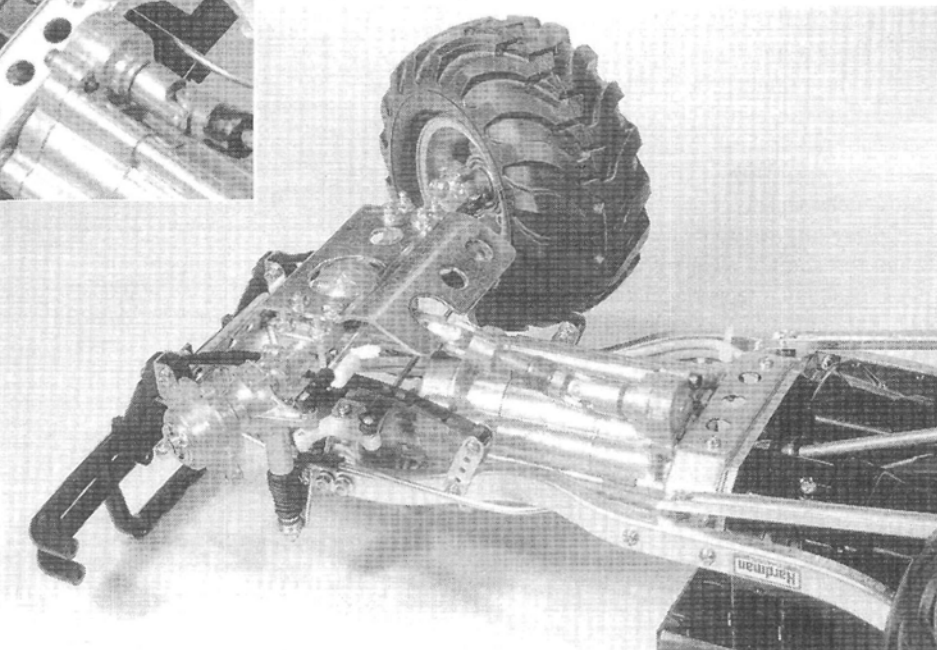
I don't think that Tamiya knows what's in there, either. I hear that little elves come at night and put the trannies together when no one is there.

The oversize, 750 motor is coupled to a tough, 3-speed tranny with all-metal gears. To lubricate the gears, remove the rubber plugs on the tranny and spray them lightly with WD-40. The nylon bumpers come in white, but I dyed mine black.



Left: the servos are mounted upside-down in the radio box. The extra space is for the speed-controller servo. The rear pumpkin houses simple bevel gears and a straight axle—no differential.

Below: you can see by the thickness of the skid plate and the steering knuckles just how rugged this truck is. Keep it clean, and you'll probably be able to hand it down to your kids!



ing. It's easy to assemble, yet it can challenge anyone who wants to put extra effort into it. Its rugged drive train is a natural for truck pulling. As with a full-size truck, you can play with it in the mud, or you can just stay home and wax it.

**Here are the addresses of the companies mentioned in this article:*

Tamiya America, Inc., 2 Orion, Aliso Viejo, CA 92656.
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.
Metalflake Corporation, P.O. Box 165, Rte. 110, Amesbury, MA 01913.
Testor Corp., 920 Buckbee St., Rockford, IL 61104.
Autographics, 7401-1 White Ln., Bakersfield, CA 93309. ■

NITRO NEWS

RUBBER ROUND-UP

by JEFF BRONSTEIN

THOUGH MODIFIED motors and two-speed transmissions are fine, all the speed secrets in the world don't count for a hill of beans unless the power can reach the road. Without traction, you're just—pardon the pun—spinnin' your wheels. Tire compounds and tread designs have come a long way, but trying to decipher all the colors, numbers and tread patterns can be like playing Twister in the dark. (Sounds like fun, though!)

The pre-race preparation of tires and wheels is as important as the type of tires that you use. Measuring, truing and balancing are special skills that aren't usually used by the average electric racer, but even factory-mounted tires need some fine-tuning. Gas racers also have to consider the effects of tire wear on their cars' performance. Although the right tire setup can improve chassis tuning, grueling gas Mains take their toll. In 1991, Ralph Burch Jr. lost an important national championship. Even though he was in



Many European tire (or "tyre," as the case may be) manufacturers box their products. Arrows Tyres were used by the current World Champion in Austin, TX.

the lead most of the time, his front tires wore completely to the rim and cost him the race. All the horsepower in the world won't help a race car that has the wrong set of tires.

Off-road tires are characterized by their patterns of pins or lines, whereas on-road tire compounds are generally represented by a color or a number that designates their firmness. After the first qualifier in an off-road race, everyone knows which tires work and which don't, just by checking out the front-runners. A mad dash ensues to find the same or similar tread patterns. (Isn't it amazing how those tires are always the ones in short supply?)

On-road racers, however, don't have the luxury of knowing what the fast guys are using, because one tire looks basically like every other: pinks, silvers, golds, 70s and a range of others, including "gummy-bears." Although different manufacturers may use the same designations, the materials in the tires are generally not the same. In fact, even the firmness of two different sets of the same tires from the same manufacturer may vary.

Rather than buying one or two



After the tires have been balanced and trued to the correct diameter, match several pairs of the same density. Some tires will be for practice, while others may play a key role in an important victory.

TIRE DUROMETERS

To some extent, experienced racers can actually feel and smell the difference between tires, but the only accurate way to determine the relative density of tire rubber is with a durometer—a device that measures the firmness of a surface.

Using and understanding the durometer gauge is extremely simple. A small, spring-loaded feeler pin presses into the tire material to measure its density. For the most accurate reading, several measurements taken at various points around the tire's surface are necessary. Always avoid the center of the tire where the glue joint is located. Soft, high-traction rubber measures low on the durometer, while harder rubber, which has less traction, measures higher. Durometer measurements of virtually all "usable" tires should range from the low to mid 20s and the mid to high 40s.

A durometer is especially important for evaluating new tires and/or for precisely matching pairs for racing.

Some racers take a durometer to the hobby store to measure tires before they buy them. (I wouldn't recommend this unless you're a valued customer.) Even tires that are labeled with the same firmness by the manufacturer may produce readings that vary by as many as 5 to ten points when they're measured with a durometer. Remember, there's no rule that says the two tires bought as a pair have to be run together.



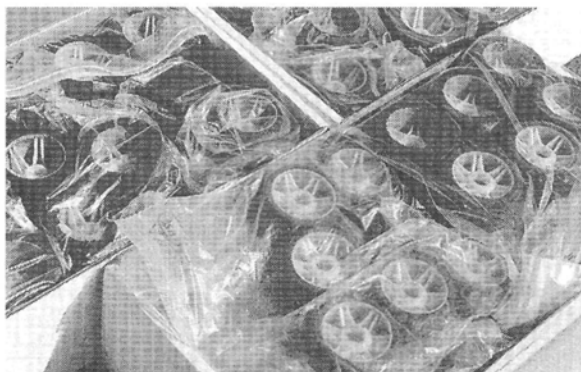


Keep track of how each tire measures by marking it on the inside of the rim. Tires will harden and even crack if they're not stored properly.

sets of tires each week, I usually buy enough for about 2 to 6 months of racing. After all the tires are carefully mounted (see "How to Mount Tires" by Larry Cole, *Car Action*, May '93), I store the entire batch in an airtight carton or in Ziploc bags to keep them fresh. As needed, I true and balance several sets and then measure them for density. A single measurement is all but useless, except that it can be used to compare the performance of several other sets of tires. Once the performance of a measured set of tires is known, the relative performance of other measured sets can be estimated. Pairs are then collectively matched for the best performance. Like cards in a hand of poker, some tires are discarded or used for practice, and others are held for the right "full-house" main event.

Different tire brands may actually have identical measurements from the durometer, but the tire's performance can be affected by the wear. A close examination of the rubber shows that some tires have a considerable amount of texture, while others are smooth. A tire with a rough surface that's full of small air bubbles will have excellent traction, but it will also wear quickly and, possibly, chunk or

peel. A flat, smooth texture may indicate a long-wearing, stable compound. Some racers say that soft, high-wear tires have a rubbery smell, while long-wearing tires smell "fishy" or "spoiled." Some of the three-ring tires use two materials to enhance traction



Rather than buy one or two pairs of tires each week, buy enough for at least two to three months of racing. (You may even get a store discount, if you're lucky.) Having a variety of tires on hand is the best way to be prepared for any situation.

and wear and, in some cases, the inner ring is made of a less expensive filler-type material. It can be difficult to find a tire that has excellent traction and low wear.

In racing, selecting the right tires is comparable to tuning the chassis; it can improve steering, and/or enhance understeer or oversteer. Up front, softer tires will produce better steering and

reduce push. Harder fronts will reduce oversteer on slick, low-traction tracks. At the rear, soft tires improve traction and increase understeer. Harder rears produce a drift and, if they're handled properly, they'll produce a quick race car.

Many racers make the common mistake of trying to use too much traction. More traction is not always better. Assuming the chassis is set up correctly, in some cases, too much traction can create wheel hop. Obviously, traction doesn't help if the tire doesn't contact the road. If the car is suffering from this condition, a harder tire will actually improve traction and handling.

One of the most important considerations in gas racing is how the tires will wear during the entire event. Unlike electric racing, gas racing can be brutal on tires. Winning may hinge on striking a delicate balance between traction and wear. Having tires that work on most tracks means having an adequate supply of tires on hand. Tire selection is the last factor I consider before the actual competition. It's also the factor I ponder the most before rendering a decision. In some cases,

racers would rather ignore wear and, when necessary, change tires during the Main.

Monitoring tire wear is also important. Between qualifiers, the wear on both front and rear tires should be carefully measured with a set of calipers. Note the temperature of the track and the time of day. Estimate the potential wear and account for as many variables as possible. Tracks with high wear are particularly dangerous, especially during long Mains.

Don't run out of precious rubber; plastic wheels don't have much traction.

P.S. Some racers ask me why I occasionally write about the basics—one reason is the ever-growing number of gas novices. I hope, however, that the articles I write will be thought-provoking for all gas racers, no matter what their levels of expertise. ■

HOME-BUILT PROJECT

Outrigger Prototype

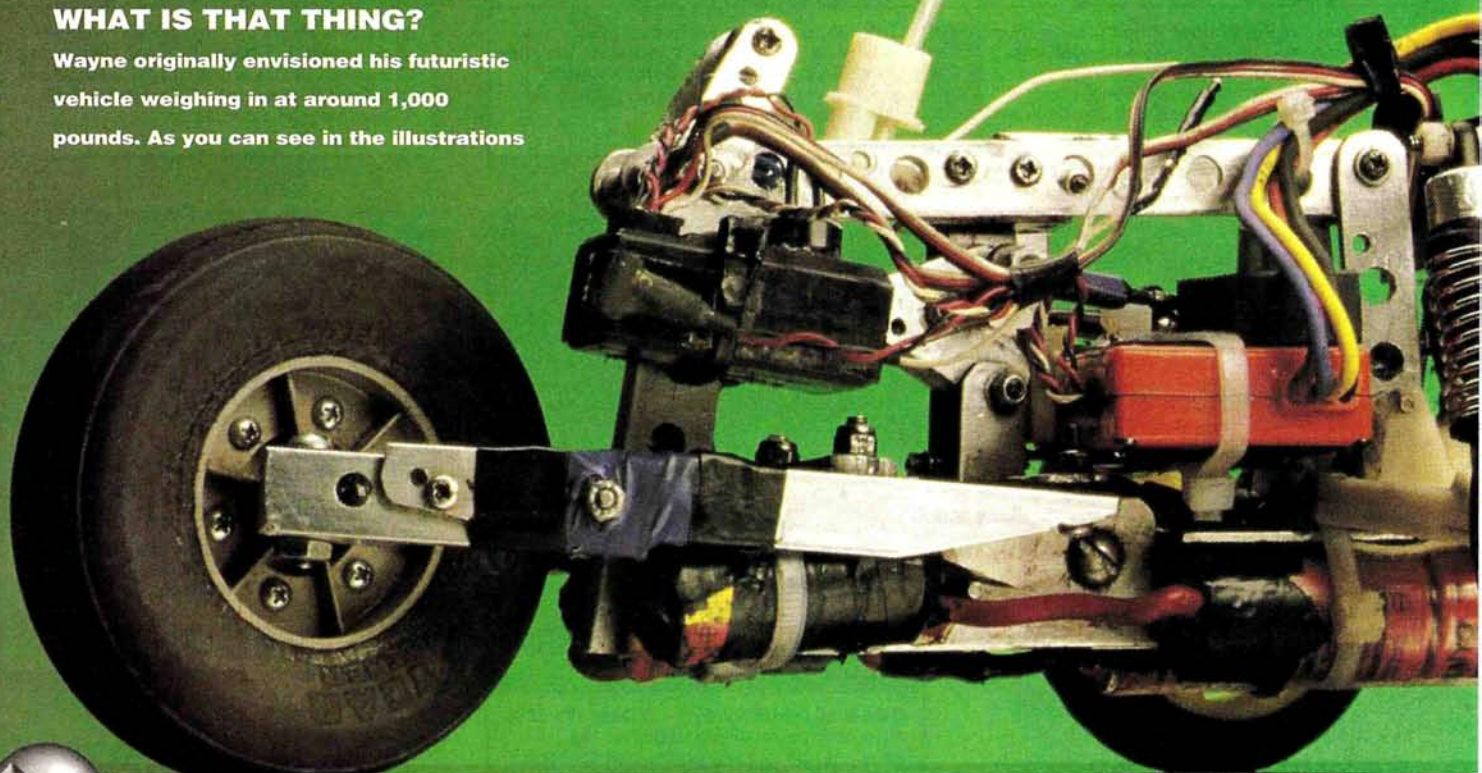
Future shock!

WE'VE ALL had visions about what our future modes of transportation will be like. Right? Our daydreams range from spaceships and portable hovercrafts to the transporter pads you might see on "Star Trek" reruns. I've often thought about what I'll be cruising around in—or on, for that matter—in 20 years or so. By then, I'll be in my early 40s, and all I can say is that it better be cool, whatever it is! And a suave leather interior is absolutely a must.

Wayne SooHoo, a systems-integration specialist from Crystal Lake, IL, has taken his futuristic dream machine to the drafting table and scaled it down to a 1/5-scale R/C prototype called the "Dymonde Sports Cycle"—a concept car that he hopes will one day be a popular mode of transportation.

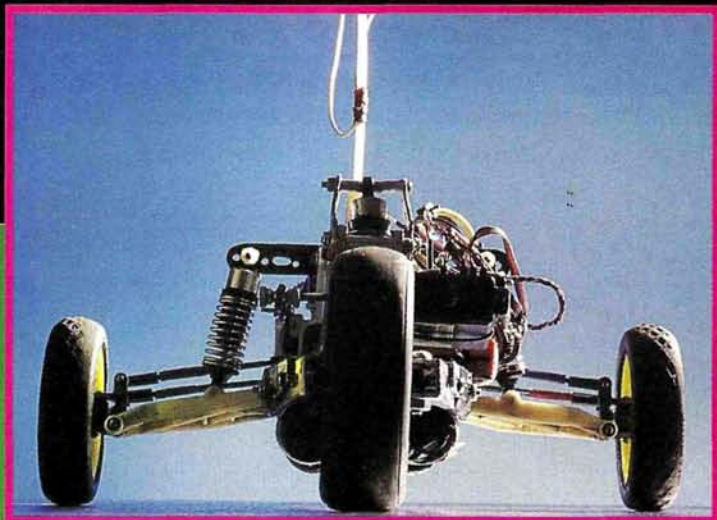
WHAT IS THAT THING?

Wayne originally envisioned his futuristic vehicle weighing in at around 1,000 pounds. As you can see in the illustrations



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by JOHN HOWELL



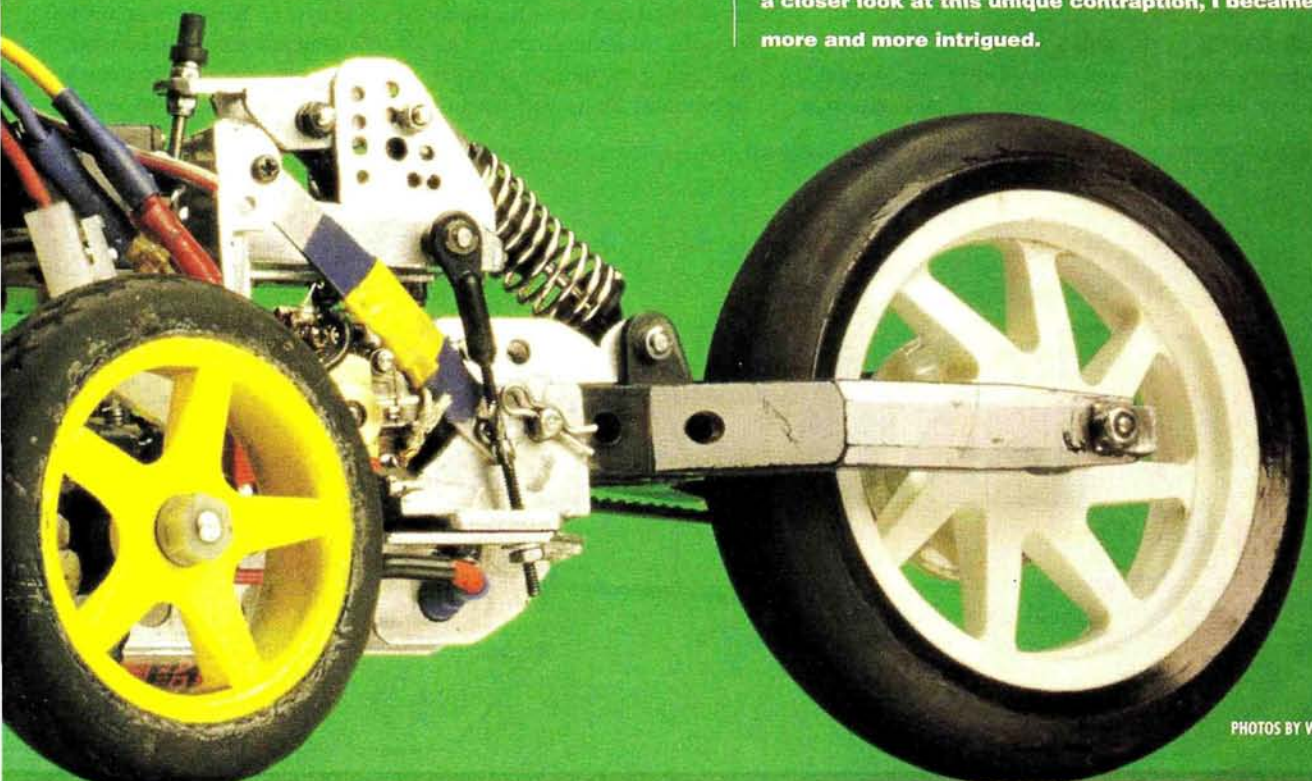
and the photos, the main in-line wheels carry most of the load, while the outrigger wheels add stability and assist with cornering. Think of it as a motorcycle with training wheels.

The front wheel and the two outrigger wheels are arranged on a diamond platform, and they all steer the car. The car's unique feature, however, is its ability to lean into a turn. Yes, you read it right: the Dymonde actually *leans* like a motorcycle, but it's as stable as an automobile.

In September '91, Wayne hired a machinist to build a go-cart version of the vehicle, but problems

arose, and Wayne decided to use R/C to demonstrate his concept. The prototype was made with L-shaped and U-shaped aluminum shower-door material, and it had roughly 100 screws and nuts holding it together. The only tools that he used to make the frame were a drill press, a bandsaw and a sanding disk.

The first time I laid eyes on Wayne's Dymonde Sports Cycle, I had no idea what it was. It looked like one of those gas-powered tether cars that were popular in the '50s and '60s. "Strange" is definitely the operative word for this vehicle, but when I took a closer look at this unique contraption, I became more and more intrigued.



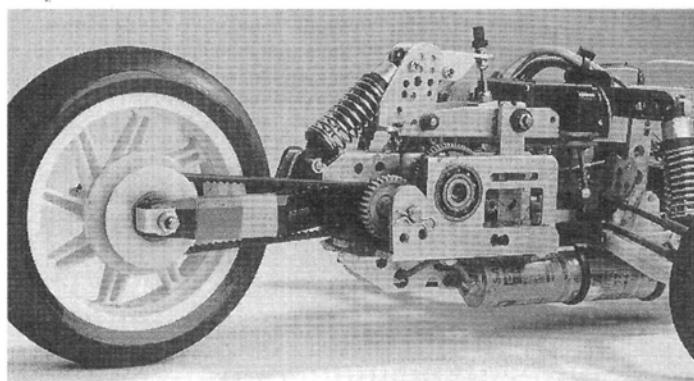
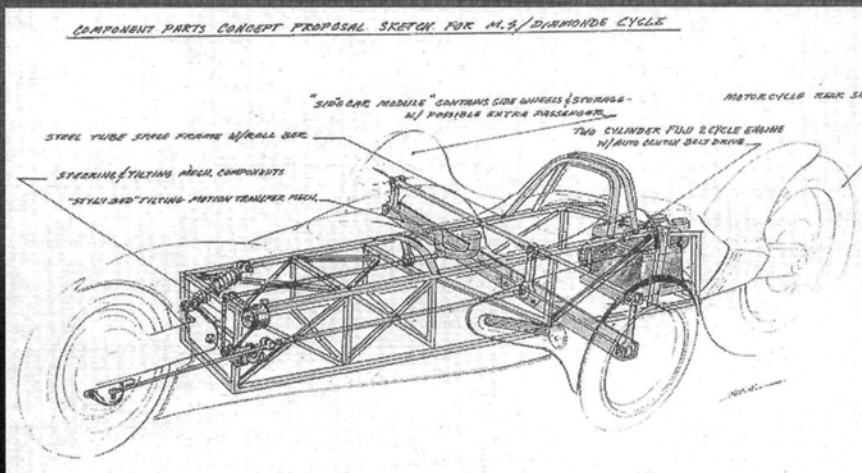
PHOTOS BY WALTER SIDAS

Wayne's World!

The Dymonde Sports Touring Cycle was created to meet the changing needs of motorcycling enthusiasts. Named for its diamond shape (when viewed from the top), the vehicle has the maneuverability of a motorcycle and the stability of a race car. The working prototype handles and performs well, and it incorporates unique safety features into its design.

Manufacturing restrictions, certification testing and licensing costs are reduced because the Dymonde is designated as a motorcycle with one or two sidecars. To meet the definition of a motorcycle, the vehicle has a 2W, in-line layout with two additional outrigger wheels mounted on the sides of the main chassis.

Near each side-mounted wheel is a small storage unit. An optional passenger seat can be



A Kyosho LeMans 480G motor powers the D.S.C. The rear swingarm was grafted from a Royal motorcycle kit.

THE INS AND OUTS

The Dymonde is really trick! The leaning is accomplished

with a rotary yoke that's driven and controlled by the "leaning" servo, which, in this case, is a

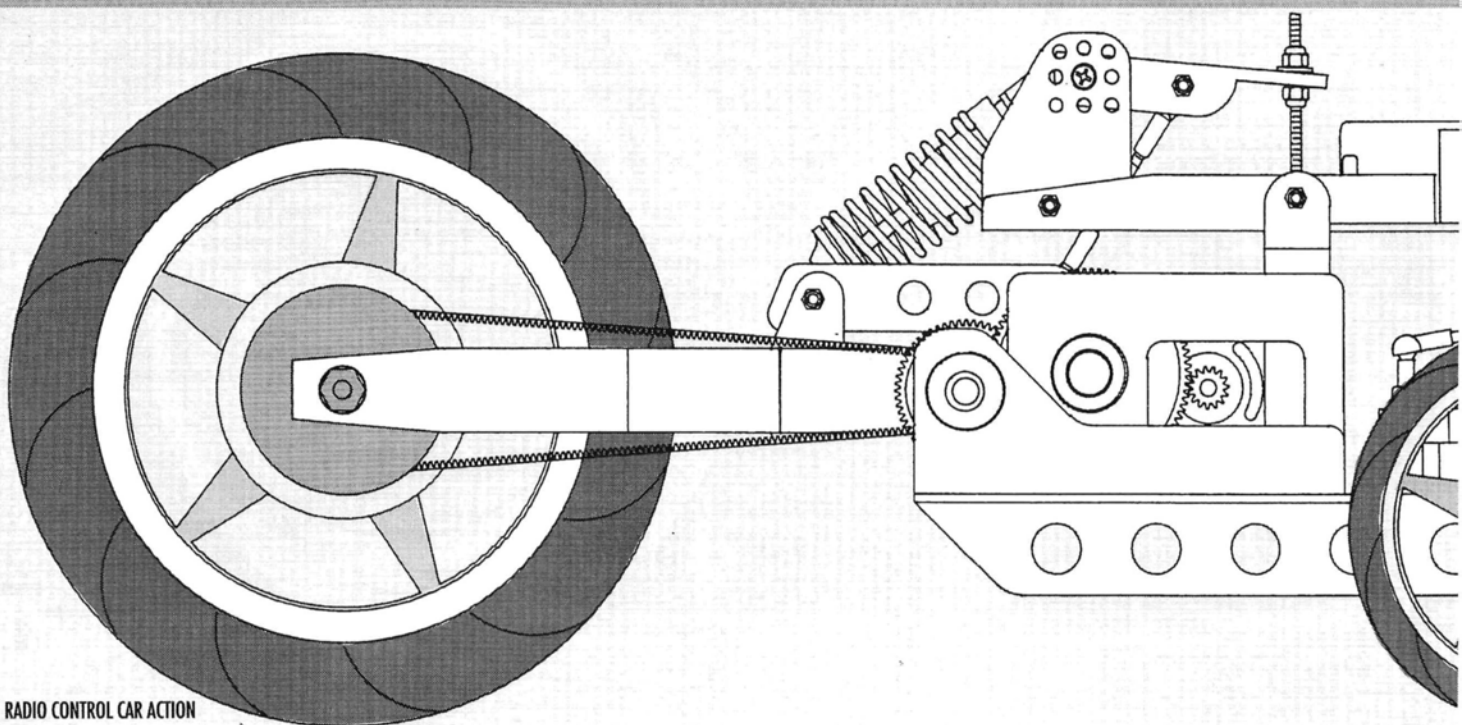
Futaba* 9302S. The center of gravity is behind the outrigger wheels, and its maximum lean angle is 22 degrees. When it enters a turn, the car actually leans into the turn (similar to the way a motorcycle leans into a sweeping turn), while the front wheel (a model-aircraft landing-gear wheel) and two outrigger wheels steer.

Wayne discovered that when the car is leaning into a turn, centrifugal force strains the servo. It takes a lot of torque to keep the car pivoted down, e.g., in a high-speed turn. Centrifugal force makes the vehicle want to

"upright" itself; the car's center of gravity would then be higher, which would throw off the car's handling.

To solve the problem, Wayne is currently experimenting with a servo-locking device and a clutch-like device. Unlike a servo-saver, which protects the servo if it comes under too much strain, a servo-locking device locks up so the servo won't "give out" in the middle of a turn.

So far, Wayne has only encountered servo strain when the car enters a turn. Too much load is placed on the servo

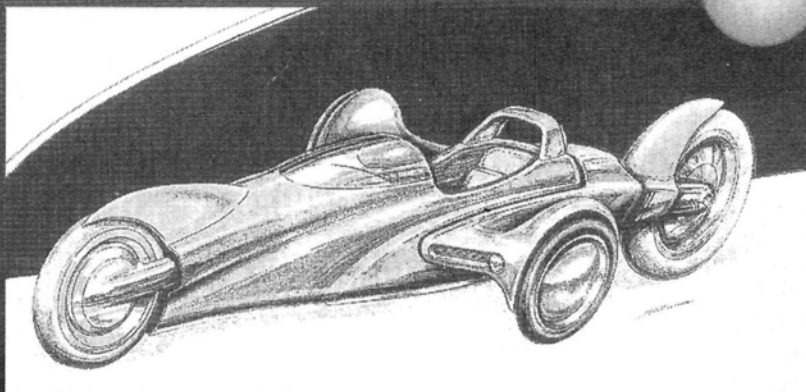


incorporated behind the driver, and the load-carrying module creates the two sidecars. A removable canopy covers the passengers, and the upper half of the modular body swings upward to expose the engine.

The vehicle can lean into turns because of its specially designed suspension system. It performs like a two-wheeled motorcycle, but it has the added stability of four wheels. The two side-mounted wheels also lean and steer.

A 2-cylinder, 2-stroke, water-cooled 440cc aluminum engine is transversely mounted behind the driver's seat. The drive output is a variable clutch with belt-drive to the rear wheel. Other models have been proposed with engine sizes up to 1,000cc.

The lightweight metal chassis is a spaceframe design with independent front, side and rear suspension systems. The engine, the rear-wheel drive and the fuel tank



are in the rear of the chassis. The chassis' parallel side rails help to protect the passengers and provide attachment points for the overhead rollover bar structure.

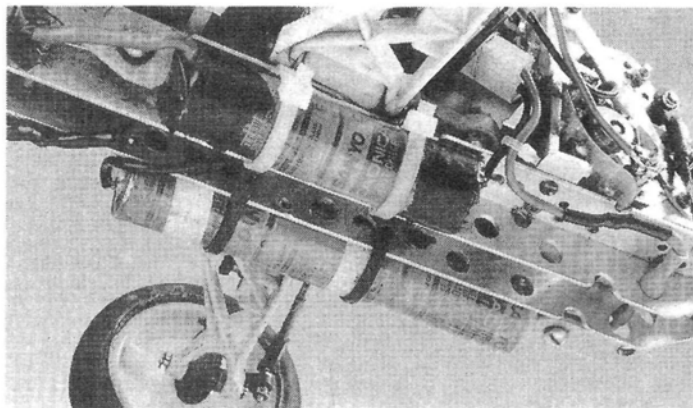
when the car enters a turn too quickly and can't lean quickly enough. As the car exits the turn, centrifugal force subsides, which reduces the strain on the servo. When a car corners at slower speeds, more steering than lean can be used. If you enter a turn too quickly, more lean can be used to scrub speed; then you reduce the lean and add more steering past the corner apex.

SUSPENSION SOLUTION

For the front and rear suspension, Wayne decided to use the

conventional independent suspension that's used on motorcycles. The front and rear swing-arm suspension systems are linked to the chassis, and a single, oil-filled, coil-over shock on each end of the chassis provides the damping. Both outrigger wheels have a shock on each side to dampen the side-to-side movement through the turns, and they're linked to the rear wheel with an anti-roll bar. The outriggers use Associated* RC10T suspension arms with Losi* carriers and spindles, and 2.2-inch Pro-Line* wheels.

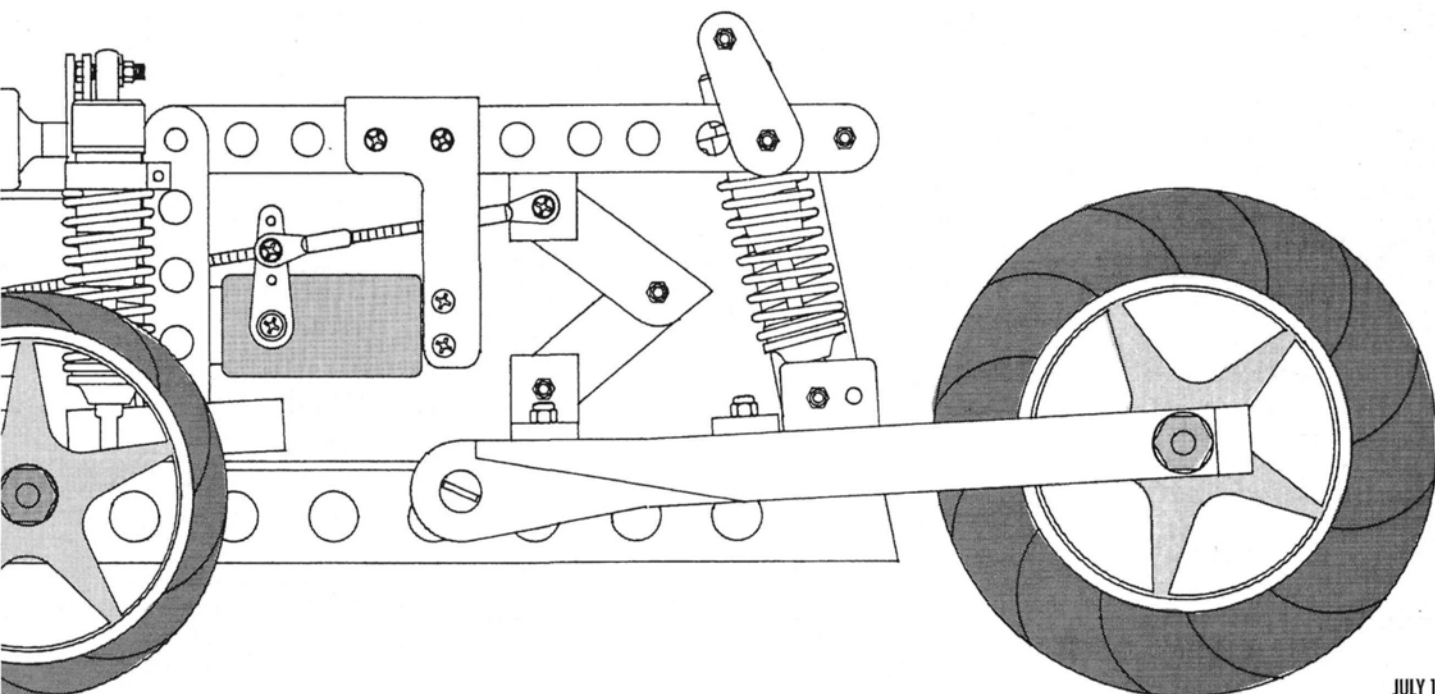
The Dymonde's primary



Note the cells underneath the chassis. Wayne runs seven Sanyo 1400 SCR cells in his machine.

drive train is a pinion/spur-gear setup, which drives a belt-drive

system. The prototype, which is powered by a Kyosho* 480G



OUTRIGGER PROTOTYPE

LeMans motor, is light (considering all the material involved); it weighs 4 pounds, 5 ounces with seven cells. Wayne used a Novak* 610RV so that he could test the prototype with reverse.

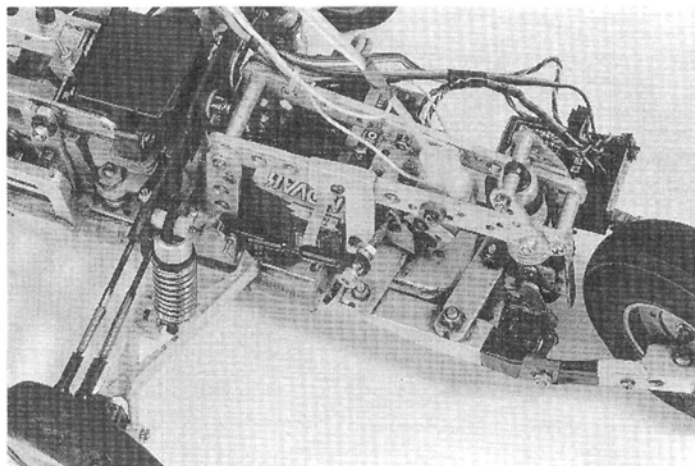
The Dymonde has many practical R/C applications. It can be used as a general-purpose, on-road vehicle and a competitive on-road oval racer with just one leaning servo and a steering servo with one- to three-wheel drive. It could even be an Insane Speed Run contestant at the Thunderdrome race.

would have made a better comparison, but all the components wouldn't fit properly. So to even the score slightly, Wayne added some weight to the Kyosho car; then he removed the front dogbones so it would have only rear-wheel drive.

The Dymonde has a higher top speed than the Lumina, but on the skidpad the Lumina fared slightly better. The Lumina pulled .89G while the Dymonde managed to pull only .66G. Right now, the Dymonde is limited because of the tire and



Here's the mad scientist himself—Wayne SooHoo—kneeling beside his "roughed-out" prototype.



The Dymonde Sports Cycle requires two servos: one for steering (Futaba 131S) and one for leaning. The Novak 610RV is next to the steering servo.

TRACK TESTING

Once Wayne had the prototype up and running, it was time to test it on the skidpad to see how many G's it would pull. For those of you who don't know, a G is a unit of acceleration equal to the acceleration caused by gravity at the earth's surface—about 32 feet per second. Trust me; just keep reading!

For comparison, Wayne ran the Dymonde against a more conventional adversary—a 1/10-scale 4WD Kyosho Chevy Lumina. Unfortunately, there were some inequities in this comparison: the Kyosho is much lighter; it has a shorter wheelbase (5.5 inches), its center of gravity is lower and, most important, it has more "rubber" on the road. Also, the Dymonde is 1/5 scale and the Kyosho is 1/10 scale. A reworked version of the Dymonde in 1/8 scale

wheel selection. There just aren't that many that will fit the prototype. Wayne has theorized that the Dymonde would perform better and pull higher G's with some modifications. A few of the modifications might include:

- redesigning the lower chassis to accommodate batteries for better leaning clearance;
- shortening the wheelbase slightly;
- a FET-boosted servo for smoother, high-power operation;
- a leaning servo lock that will lock the servo when loads come within 85 percent of the servo-rated output;
- different tires and wheels.

The way the Dymonde runs now, the handling is much different from conventional R/C cars. For example, let's compare the Dymonde with the Kyosho Lumina. Owing to the lower rolling resistance of its narrow profile tires, the Dymonde coasts farther than the Lumina and, although the wheelbase is longer on the Dymonde, both cars turn in the same amount of space up to speeds of 25mph. The Dymonde could be the wave of the future. It's totally trick, and it looks as if it would be a blast to ride in.

MAYBE SOMEDAY

I took Wayne's futuristic prototype machine home one night to study it. It really amazed me how the Dymonde worked. I worked the outrigger system with the front steering while it was lying on its side. Then I imagined that I was behind the wheel of a full-size vehicle, pitching sideways into a tight, twisty corner at over 100mph with the tach pinned and the engine screaming.

I got that feeling I get when I go to a full-scale car show where the high-tech concept cars of the future are on display. You know—that feeling of total awe and excitement, when you wish that those cars were on the market right now. Who knows what we'll be driving in the future? I just hope that the Dymonde is an option, but only if it comes with a leather interior.

For more info, or comments, you can contact Wayne at the following address: Dymonde Car, P.O. Box 768, Crystal Lake, IL 60039.

Projected cost of building the Dymonde Prototype

Chassis construction	\$6,500
Running gear components	\$11,750
Temporary body and pattern/molds	\$10,500
Staff support	\$18,000
Custom-designed mechanical components	\$23,000
Facility/shop rent per year	\$13,800
Component and vehicle testing	\$10,000
Travel, marketing and insurance	\$10,400
TOTAL COST	\$104,000

*Here are the addresses of the companies mentioned in this article:
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.
Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.
Team Losi, 13848 Magnolia Ave., Chino, CA 91710.
Pro-Line USA, P.O. Box 456, Beaumont, CA 92223.
Kyosho/Great Planes Distributors, P.O. Box 9021, Champaign, IL 61826.
Novak Electronics, 18910 Teller Ave., Irvine, CA 92715.
Robart Manufacturing, P.O. Box 1247, St. Charles, IL 60174.
Royal Products Corp., 790 West Tennessee Ave., Denver, CO 80223.
Speedworks, distributed by Trinity Products Inc., 1901 E. Linden Ave., # 8, Linden, NJ 07036. ■

T H U N D E

BBS RACING LUMINA

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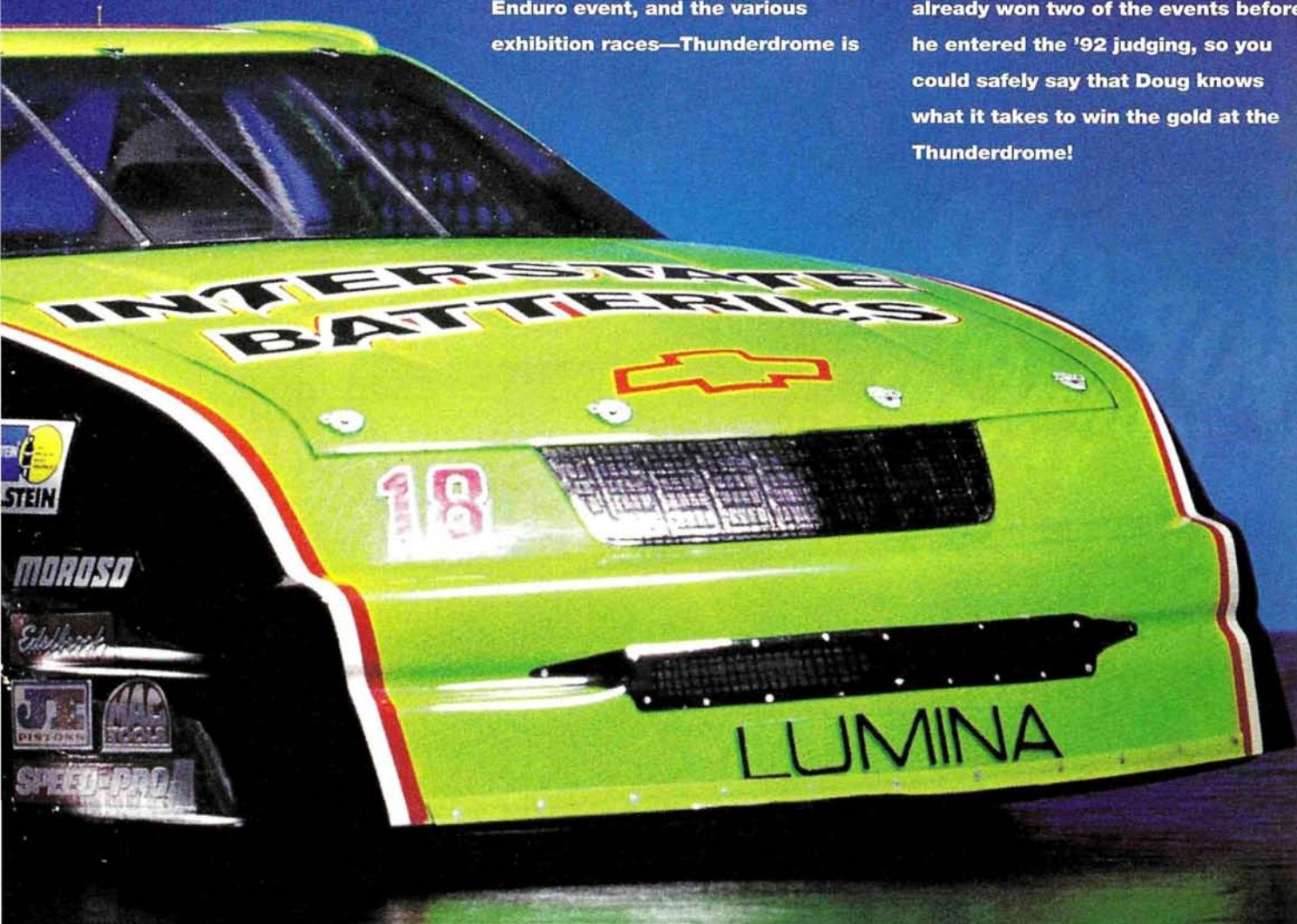
R D R O M E

THE ANNUAL Thunderdrome race, put on by Dan Moynihan and Gary McAllister and sponsored by *R/C Car Action* magazine and Futaba, is without a doubt the premier event

on every R/C racer's calendar. The Thunderdrome's popularity is easy to explain: it's not merely an R/C race; it's an extravaganza! In addition to the many types of racing action—the 4-minute superspeedway, the Pro Enduro event, and the various exhibition races—Thunderdrome is

host to a multitude of activities and attractions, one of which is the always-competitive Concours event.

Doug Warneke, of Chatsworth, CA, is no stranger to the Thunderdrome Concours competition. He had already won two of the events before he entered the '92 judging, so you could safely say that Doug knows what it takes to win the gold at the Thunderdrome!



Concours Winner

Scaled-Down Stocker

BODY BUILDING

Doug actually began to plan his concours entry in June of '91, because he knew that to win for an incredible third time, his ride would have to be something really special. Plus, General Electric was going to award a check for \$500 to the '92 winner, and that's enough to motivate anyone.

Doug chose to build a replica of the Joe Gibbs Racing Chevy Lumina. Its striking color scheme would lend itself well to a 1/10-scale reproduction in Lexan. A .040-inch-thick Protoform* Lumina body was the most logical choice because of its incredible detail. One factor that would work against Doug was that there weren't any commercially available graphics (decal) packages available to duplicate those on the full-size Gibbs car. The decals would have to be custom-painted by someone with extraordinary skill.

Having been a long-time reader of *Car Action*, Doug was familiar with the work of Scot Bich of Bich'n Bodies*, so he contacted Scot to see if he would be willing to take on such a difficult project. It's obvious from the finished product that Scot accepted the job!

INTERIOR DESIGN

Using interior photos of numerous full-size NASCAR racers as a guide, Doug carefully shaped sheets of Lexan to form the interior floorpan. The highly detailed dashboard and the driver figure came from a McAllister* kit, while the gearshift is actually a RC10 front axle with a ball end glued to its top. The neat-looking shifter boot is really a Duratrax* carburetor boot! Scale-looking dashboard gauges and switches were pirated from a 1/24-scale plastic model kit to add that extra touch of realism that the concours judges look for. Other interior details include a fire extinguisher that Doug hand-carved out of wood and an on-board video camera that's actually made out of an R/C car steering block.

To protect the driver from injury if the car rolls over during a race, NASCAR racers must be equipped with a full roll cage. On Doug's scale stocker, lengths of Plasti-Strut were meticulously joined to form an intricate cage. The padded sections were created by slipping pieces of automotive vacuum tubing over the Plasti-Strut—ingenious.

When the body came back from the painter, it still needed some detailing.



A Dahm's Thunderbody undertray is attached to the underside of the specially narrowed Twister Cyclone chassis. Ballistic Batteries supplied the horsepower.

Various NASCAR sponsorship decals were applied to the stocker's fenders, and aluminum windshield clips from Detail Master* were attached to the Lexan windshield. Doug fabricated the tiny two-way radio antenna from a simple straight pin, and he made the side-exit exhaust pipes and the fuel-tank vent hose.

To give Doug's car the edge in appearance and in performance, special black-anodized JPS* aluminum rims were fitted with

rubber-capped foam tires by CKW*.

CONCOURS CHASSIS

Because all concours entrants had to be operable (no static models here!), Doug had to come up with a suitable chassis on which to mount his super-detailed body and interior. He chose a prototype variant of Twister's*

Cyclone car that was specially narrowed to superspeedway dimensions by Steve Dunlavy. For radio gear, a Novak* T-1X electronic speed controller and KO Propo* receiver and steering servo were used. Horsepower comes not from a stroked V-8 but from an outlaw stock motor and a set of matched Sanyo 1400mAh SCRs from Ballistic Batteries*.

When the chassis was complete, Doug used Velcro® to attach the body/interior assembly to a Dahm's* Thunderbody undertray. The trick display sign—a must if you want to impress the concours judges nowadays—was provided by Sign Art*.

INTENSE COMPETITION

The competition was intense, to say the least. As a matter of fact, the initial concours judging resulted in a three-way tie! Only after lengthy deliberation did the judges finally award the first-place trophy—and the check from General Electrics—to Doug and his remarkable car. All told, Doug estimates that he spent more than 200 hours working on his project. I think you'll agree that it's time well spent! What's next for Mr. Warneke? Well, he has already begun working on his entry for the '93 event!

**Here are the addresses of the companies mentioned in this article:*

Protoform, 537 Niagara St., St. Catherine's, Ontario L2M 3P6 Canada.

Bich 'n Bodies, 4903 Cloverfield Rd., Pearland, TX 77584.

McAllister Racing, 1000 N. Humphreys St., Ste. 204, Flagstaff, AZ 86001.

DuraTrax; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826.

Detail Master, P.O. Box 1465, Sterling VA 20167.

JPS Custom Wheels, P.O. Box 3014, Fullerton, CA 92631.

CKW Mfg., 1889 W. Commonwealth, Unit 1, Fullerton, CA 92633.

Twister Motors, 657 E. Arrow Highway, #H, Glendora, CA 91740.

Novak Electronics, 18910 Teller Ave., Irvine, CA 92715.

KO Propo; distributed by Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley, CA 92728.

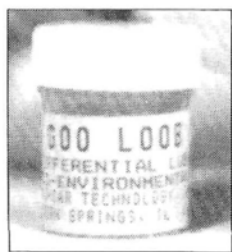
Ballistic Batteries, 11725 Gerald Ave., Granada Hills, CA 91344.

Dahm's Racing Bodies, P.O. Box 360, Cotati, CA 94931.

Sign Art, 12022-C Centralia Rd., Hawaiian Gardens, CA 90716.

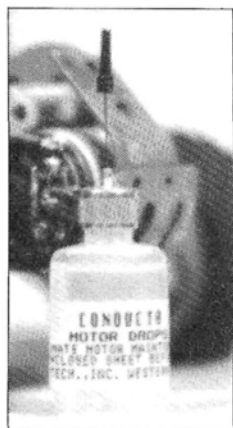
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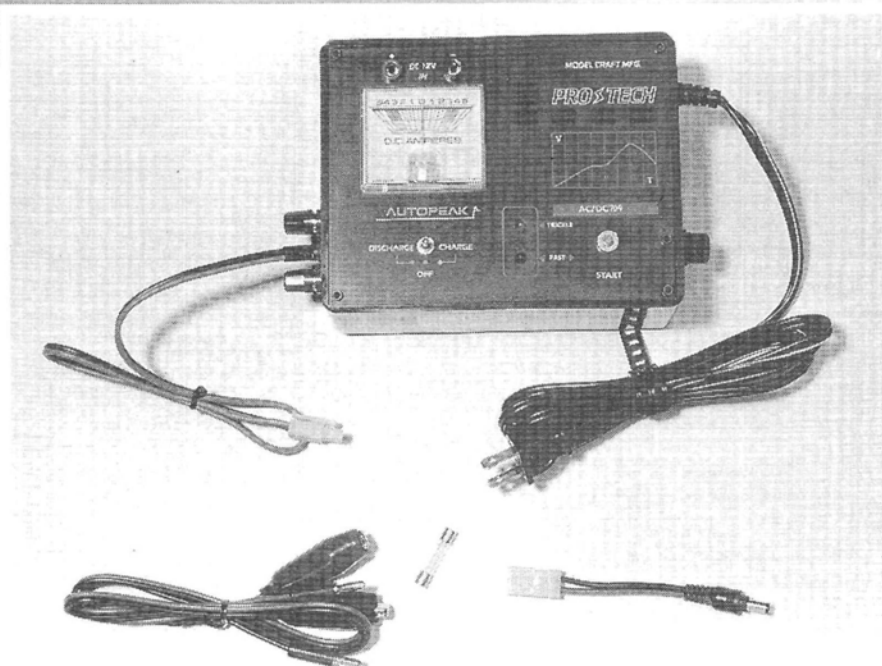
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Pro-Tech's 709 charger comes with everything you need to zap your batteries: an AC plug cord for house current, 12V DC power cables for when you're in the wild, a spare fuse and an adapter that allows the unit to charge your Ni-Cd transmitter packs.

Pro-Tech Charger

by LOU MARCIELLA

Put It On Master Charge

ASK 10 HOBBYISTS to tell you the best way to charge a battery, and you'll probably get 10 answers. They'll probably agree that the peak-charging method is the only way to go. But, inevitably, they'll argue about the best type of peak-charging: pulsed, linear, thermal, etc. If you want to add to the confusion, just inquire about discharging, and you'll start hearing ridiculous advice, such as, "Only discharge your packs during a full moon while you're standing on your head." Are you starting to get the picture?

LOSS OF MEMORY

While the science of Ni-Cds and charging methods con-



The Autopeak AC/DC 709 charger can also be used as a battery-pack discharger. The built-in ammeter lets you keep tabs on the charging process, and the LEDs tell you whether the unit is fast-charging or trickle-charging.

tinues to evolve, one hard fact about these batteries has been established: they develop a "memory" if they're not properly charged and discharged. In this article, I won't delve into battery or charger theory, but I *will* check out the new Pro-Tech 709 "smart" charger.

ARTIFICIAL INTELLIGENCE!

I'm quite familiar with the Pro-Tech/Model Craft* name, but their designating the new 706-708-709 series as "smart" chargers intrigued me. What makes these units so intelligent? They not only peak-charge your batteries, but they automatically discharge them to a certain level to allow another full charge. Great scott! Now there should be no more worries about cell-reversal (caused by draining a pack too much) and no more hassles with light bulbs, resistors, etc.

POWER TO THE PEOPLE

After I had opened Pro-Tech's trademark blue-and-yellow box, I glanced at the contents, scanned the instructions and removed the Pro-Tech 709. I was impressed by its high-tech, black-satin, aluminum face and its hefty feel—a likely indicator of a heavy-duty transformer. Hey, this thing is AC-powered, so you won't have to lug around a power supply! DC input sockets, a current-adjusting knob, two LEDs, a start button, a functions toggle switch and a large, easy-to-read, analog voltmeter occupy the front. A Tamiya-type connector cord, output jacks, a fuse holder and an AC cord are on the sides. DC input cables (also included) let you hook the 709 to your car battery when you're out in the boon-docks. And a handy adapter plug lets you charge up your transmitter or any other 9.6V battery pack. Everything seems simple and well-thought-out. Just plug this charger into a wall socket, connect your pack (depending on your plug types, adapters might be necessary) and push a button! Sounds good, doesn't it? Let's try it out.

HARD CHARGIN'

Place the charger so that the vents are facing upward (this allows heat to escape) and hook up your pack. (I had used a 7.2V, 1400mAh battery.) I hit the start button and activated my stopwatch. The meter showed a charging status of

5 1/2 to 6 amps, and, 18 minutes later, the 709 went from fast-charge to trickle to keep the pack topped off. The battery felt warm (but not too warm, which would suggest an overcharge); this showed that the charger had done its job properly. I wanted to see how long it would take the Pro-Tech to deplete this fully charged pack, so I switched over to the discharge mode and pushed the start button again. In 35 minutes, the meter had gone down to about 2 amps, and the charger shut itself off completely. Whaddaya know—a peak-charger and a peak-discharger all in one!



The Pro-Tech 709 can be set to discharge as well as charge; all you have to do is flip a toggle switch. You can insert DC output cables into the jacks on the side of the unit's case.

A CASE OF BATTERY

Although the Pro-Tech 709 charger can't be fairly compared with other megabuck units on the market, it does provide an excellent, reasonably priced, hassle-free way of meeting your Ni-Cd's needs. It certainly deserves the title of a "smart" charger (sorry, kids, it won't do your homework for you!), and you don't have to be an Einstein to operate it. (Anything that gives me more playtime with no fuss gets a big thumbs-up!) Next time you're in your favorite hobby shop, give the new Pro-Techs a good, hard look. I think you'll like what you see.

*Here's the address of the company featured in this article:
Model Craft Mfg., 4555 W. Pico Blvd., Los Angeles, CA 90019.

TRINITY® Evolution 10

MAGIC TRICKS

Loose is Fast; Tuning is the Key

by Joel Magic Johnson®
current IFMAR 1/10-Scale World
Champion

Superspeedway racing is intense: a tick of the clock decides whether you're on the pole or packing up for the long trip home. Superspeedway racing requires the most precise chassis setup in R/C!

The secret is to stay ahead of track conditions; to run on that ultra-fine line—right on the edge of spinning. That's right, loose is fast! Just watch the Indy cars on a big oval. The fastest cars are right on that edge. Of course, the car still has to be driveable. In R/C, you need a car that can be precisely tuned to achieve that razor-sharp balance. That brings us to the Evolution 10ss.

When Trinity designed the EV10ss, it had to be the best. The EV10ss is the most tunable car ever to run an oval. The wheelbase has three length adjustments that you can make in minutes. We use the long wheelbase for superspeedways and the short setting for tight ovals.

There are also two sets of holes in which you can mount the battery cups. This allows you the luxury of adjusting the left-side bias to suit track conditions—extremely handy when you run on many tracks!

We also designed a front suspension that, besides having Reactive Caster™ (which allows the kingpin angle to change while cornering) is completely adjustable for caster, camber and toe-in/out—just twist a turnbuckle! The changes can be made in thousandths of an inch, completely independent from side to side. You can run your car for a few laps, pull into the pits, make a few quick adjustments and be out running laps again. This is the only way to race!

We also have two new items that will make your EV10ss even faster. First is our Large Volume Shock (EV4030, \$24.99). It fits in place of the center shock and bolts on in seconds. On bumpy road and oval tracks, this shock will improve performance. Our new "Superspeedway Sway Bar Kit" (EV4019, \$29.99) comes pre-bent with a new graphite top plate that centers on the rear pod. It's a must for serious oval racers!

The EV10ss is a pleasure to work on and drive: it's the best oval car I've ever driven.

Until next time,
Joel Magic Johnson®

ADVERTISEMENT

Car Action TRACK REPORT



by JIM SHEPKA

FIRST SAW the Hyperdrive* H10RS when Ralph Burch piloted his to a very successful showing at the '92 ROAR Oval Nats at PC Hobbies Raceway, in King, NC. After seeing his impressive run, my mission in life was to get my hands on one of these land-missiles and review it. I've been lucky enough to

test-drive a range of topnotch oval cars, and I was bent on adding this one to my list.

So, after I had made a few phone calls to the editor of Car Action ("Please, please, please can I do it, huh?"), the folks at Hyperdrive were kind enough to send me an H10RS to test.

**poundin'
round
and
round**



HYPED-UP ASSEMBLY

The car was too new to have a complete set of instructions, so the folks at Hyperdrive sent along a few photographs and a couple of building tips to get me going.

The first order of business was to file down the battery slots on the chassis. With a Dremel tool, I carefully went over each slot and put a slight chamfer on the edge of each. I feel more confident when the batteries fit snugly, and by rounding the slots' sharp edges, I avoid the risk of the cells shorting against the chassis.

After that, I turned my attention to the chassis struts, stiffeners and T-plate mounts. To ensure that construction goes as smoothly as possible, all the hardware is labeled according to the order in which you'll use it. One small problem slowed me down: it was difficult to thread the 4/40 flat-head screws through the supplied nylon spacers. But perseverance (and my Binford "Super Turbo" electric hand drill and screwdriver—arh! arh!) eventually paid off.

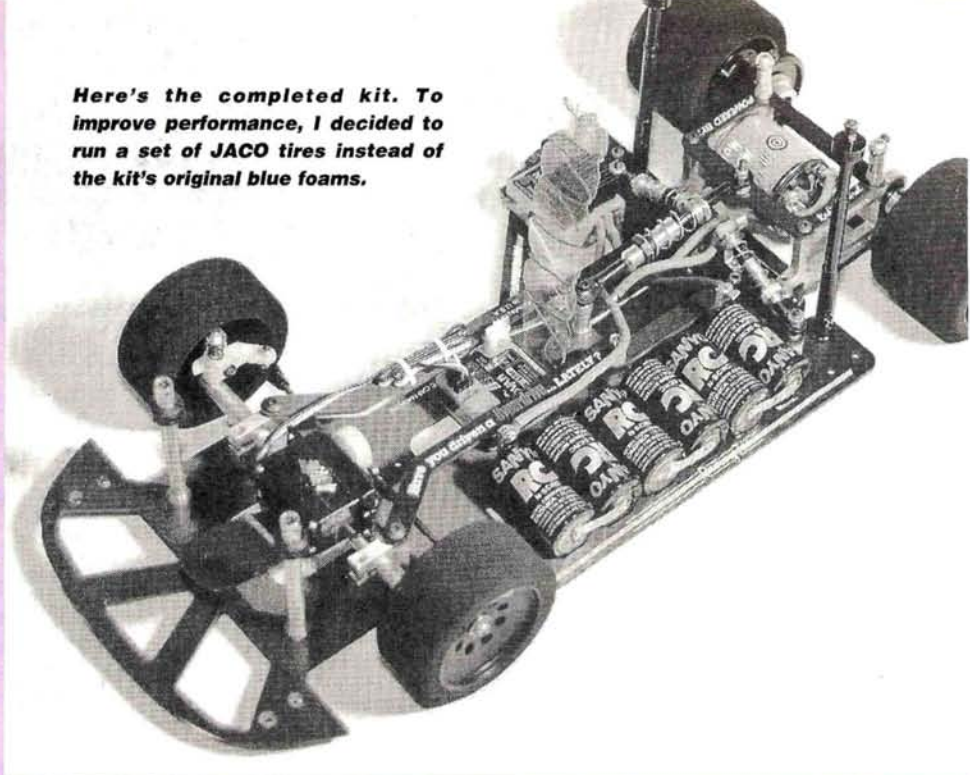
Next came the T-plate and the shock-mount assembly. The H10RS has a mono-ball link system that allows the rear pod to pivot independently of the T-plate. This allows smooth, controlled rear-end damping. You must take your time to ensure that the mono-balls pivot smoothly. For this, you'll have to make sure that all the flashing has been removed and that the balls are seated properly.

When you've attached the four mono-ball assemblies to the T-plate, it's time to finish assembling the shock tower. Insert two ball sockets into the tower support, trim them flush with the end of the tower, and secure them with 4/40 button-head screws. Then attach the shock tower to the T-plate and put the assembly aside.

POWER POD

The power pod rear-suspension assembly is pretty straightforward. First, using $\frac{8}{32}$ -inch pan-head screws, attach the left and right motor mounts to the lower pod plate. (To ensure that the mounts are in the right places, refer to the photos in the instructions.) Secure the top plate in the same way. Unlike some other Hyperdrive cars, the H10RS rear suspension doesn't have an axle tube, so ignore this section of the instructions.

Here's the completed kit. To improve performance, I decided to run a set of JACO tires instead of the kit's original blue foams.



When everything is in place, attach the power pod to the T-plate assembly. Simply align the T-plate mounting holes with those of the power pod and secure the pod with 5-40 Allen-head screws. Again, check to see whether the mono-balls pivot freely; if they don't, the shock won't absorb the bumps properly.

Instead of using the Hyperdrive belt-pulley system, the H10RS has a pro diff with Delrin drive hubs and gears. With a graphite axle, a diff-centering kit, bearings and non-slip/pin-free diff rings, you should have no problems getting the drive line up to speed.

HYPER SHOCKS

The only part of the rear end still to be completed was the shock absorbers. Having used Hyperdrive's damping system on a previous 10L project, I was familiar with its construction.

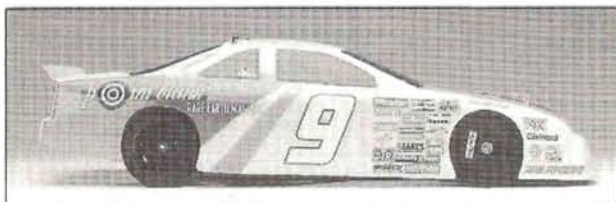
The Hyperdrive system has three shocks: two to control side roll (one for each side of the car) and one for fore/aft damping. Take your time to assemble it properly. First, remember to remove the flashing that has been left on the nylon washers and the cylinder cap nuts. These units also use an internal pressure spring, so pay attention to the manual to ensure that you build them properly.

I decided to start with 30WT oil and short springs for the two small side shocks and a longer gold spring for the main shock.

HYPERDRIVE

H10RS

HYPERDRIVE H10RS



Scale1/10
Price\$349.99

DIMENSIONS:

Overall length15.80 inches
Width8.50 inches
Wheelbase10.50 inches
Front track7.50 inches
Rear track7.75 inches

WEIGHT:

Gross (with batteries)2 pounds, 11 ounces

CHASSIS:

TypePan
MaterialGraphite

DRIVE TRAIN:

PrimaryPinion/spur
TransmissionNone
DifferentialBall
Bearings/BushingsBall bearings

SUSPENSION:

Front: TypeRigid beam
DampingFloating axle/coil spring
Rear: TypeTwo-piece T-plate
Damping3 oil-filled, coil-over shocks

WHEELS:

Front: TypeMolded plastic
Dimensions (DxW)1.8x1.125 inches
Rear: TypeMolded plastic
Dimensions (DxW)1.8x2 inches

TIRES:

Front/RearFoam, blue dot

ELECTRICS:

Motor/battery/speed controllerNot included

OPTIONS TESTED:

Futaba S-132H servo and PCM-1024 transmitter; Novak NER-3FM receiver; Point Blank 6-cell SCRCs and "Master" stock motor; JACO tires; Protoform T-Bird body; Robinson Racing "Silencer" Series pinion gears.

HITS:

- Top-quality parts throughout; fit and finish are first-rate.
- Easy to set up; one of the easiest cars to drive fast.
- Good instructions help take the guesswork out of assembly.

MISSSES:

- High-end car with high-end price tag
- On smaller tracks, a chassis with a shorter wheelbase would handle better.



the axle into place, I was a little confused. The camber angles just didn't look right! I called the folks at Hyperdrive, and they told that the left kingpin has negative camber and the right one has positive camber! Say what? They assured me that this was the correct setup for big ovals.

If you want to be on the leading edge of R/C technology, you owe it to yourself to take a look at their latest oval creation.

Who am I to question them? They're winners!

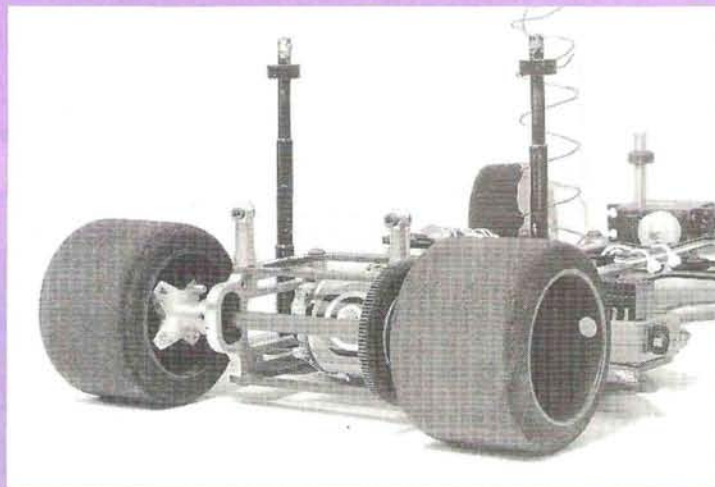
When I had properly oriented the axles, I attached the servo tray to the axle with 4/40 flat-head screws. There's some disadvantage to having the servo mounted so high; in that position, it raises the car's center of gravity, and that reduces its stability. But because the servo moves with the axle, it allows you to adjust caster without suffering from bump-steer, and that's of greater value. Heavy-duty steering blocks, axle stubs and heim joints round out the front axle assembly.

With the rolling chassis completed, it was time to add the electronics. I chose a Futaba* S-132H steering servo with a Kimbrough* servo-saver, a Novak* 75MHz FM receiver and a Novak 410-M5 high-frequency speed controller.

BALLISTIC BODYWORK

Aerodynamics plays a huge part in the success of any racing effort, so I chose one of the sleekest bodies on the market: Protoform's* T-Bird. Dale Epp has set new standards with his accurately detailed bodies. They come in two versions—standard and light—and have a separate rear spoiler.

My T-Bird body was prepped and painted by DM Graphics*. The photographs really don't do justice to the pearl-white scheme.



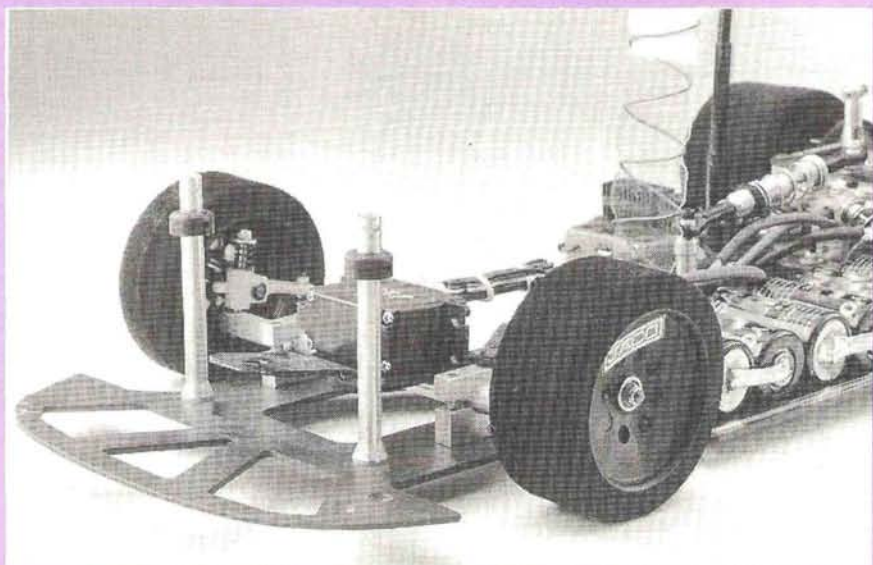
Hyperdrive pod people! The H10RS has a mono-ball link system that allows the rear pod to pivot independently of the T-plate.

FRONT SUSPENSION

With the rear suspension in working order, I had only the front-axle assembly to finish. This kit uses a standard, straight, bar axle with cinch blocks, but it also has some unique features.

First, you have to press-fit the kingpins into the axle. This takes time, but when they've at last been seated, you can bet that they won't go anywhere. They look bulletproof!

Next, determine which way the axle should be fitted to the cinch blocks to obtain the proper camber angles. When I first put



Here's a hot setup for oval racing: the H10R's front axle holds the kingpins so that the left side has negative camber and the right side has positive camber.

TEST SESSION

I opted to test my H10RS on the indoor carpet track at Mike's Speedway in Hadley, MA. I had run a number of tests there, so I'm familiar with what it takes to get around the track without mishap.

The kit comes with foam tires (blues), but I opted to use JACO* tires instead. These durable tires have always worked well for me; they offer the right combination of handling and speed. I use white dots on the rears, orange/blue on the right front and red on the left.

Power is supplied by a Point Blank*, ROAR-legal, 27-degree stock motor and matched sets of Sanyo* SCRCs. I decided to use a Robinson Racing* ultra-trick "Silencer" pinion gear. This light, hard-coated pinion gear has beveled teeth and operates quietly with minimal friction. With everything aboard, it was time to test!

It took a couple of laps to dial-in the steering and set the trim, and by then, I knew I had something special under my control. I was impressed with the H10RS's stability and particularly with the speed at which it left the turns. Steering was precise, straight-line stability was dead-on, and acceleration was awesome.

After a couple of hot laps, I pulled the car in to make a few minor adjustments, and then, every couple of laps, in search of the perfect setup, I made further minor changes—front spring rates, caster angles, shock springs, tires and gearing, etc. Of course, I made only one modifica-

tion at a time (if you change more than one thing at a time, you won't know which modification has produced a particular effect); and in the long run, I was really happy with my lap times.

CLOSING THOUGHTS

A company's commitment to quality and to satisfying consumers obviously plays a major role in its success. This is true of Hyperdrive. The H10RS is made of top-notch materials, and the instructions that come with it are first-rate. While I assembled it, I was reassured to know that help was just a phone call away. In my opinion, Hyperdrive stands tall when it comes to product innovation and quality and customer support. If you want to be on the leading edge of R/C technology, you owe it to yourself to take a look at their latest oval creation.

**Here are the addresses of the companies mentioned in this article:*

Hyperdrive; distributed by PTI, P.O. Box 4648, Winston-Salem, NC 27115.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Kimbrough Products, 1420 East St. Andrews Place/Unit F, Santa Ana, CA 92705.

Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92715.

Protoform, 537 Niagara St., St. Catherine's, Ontario, Canada L2M 3P6.

DM Graphics, 16 Doncaster Blvd., St. Catherine's, Ontario, Canada L2N 1Y4.

JACO; distributed by Pro-Line USA, P.O. Box 456, Beaumont, CA 92223.

Point Blank, 1901 E. Linden Ave. #8, Linden, NJ 07036.

Sanyo Electric, Battery Division, 200 Riser Rd., Little Ferry, NJ 07643.

Robinson Racing Products, 4968 Meadowview Ln., Mariposa, CA 95338. ■

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Air Age, Inc., publisher of *Radio Control Car Action* and other hobby-related publications, is looking for a creative, motivated individual who is

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RADIO CONTROL CAR ACTION

RACER NEWS

WORLD CLASS RACING



Crossover Racing

So what's the latest rage among those who race full-size off-landers—R/C, that's what! Here's **Rob MacCachren**—who races a stadium truck for the Veneable **Ford Racing Team** in the **Mickey Thompson Grand Prix** circuit—with his pit crew working on his **Team Losi LX-T**. Seen here at the **Seattle King County Stadium** before a race, Rob and his mechanics take some time to dial-in his "other truck." Rob hails from Las Vegas—the hometown of **Team Losi's Jack Johnson**—and both are friends of **Derek Nye**, the president of **Dirt Bagz USA**. Derek introduced Rob to the **Team Losi** guys, and they styled him out with a tricked-out replica of his own Ford truck.

So, here's the question: is Rob as fast with his **LX-T** as he is with his full-size stadium truck? Well, we're not sure, but we *do* know that he's one of the **fastest** truck drivers on the **MTGP** circuit. In '91, he won the truck Main in Seattle, and at this year's Seattle race, he was the fastest qualifier. It seems as if there has been a lot of "crossover" racing lately—especially in the full-size, off-road industry. Hey, who knows which famous racer will visit your local track soon? Maybe we'll see a few on the pages of *Car Action*!

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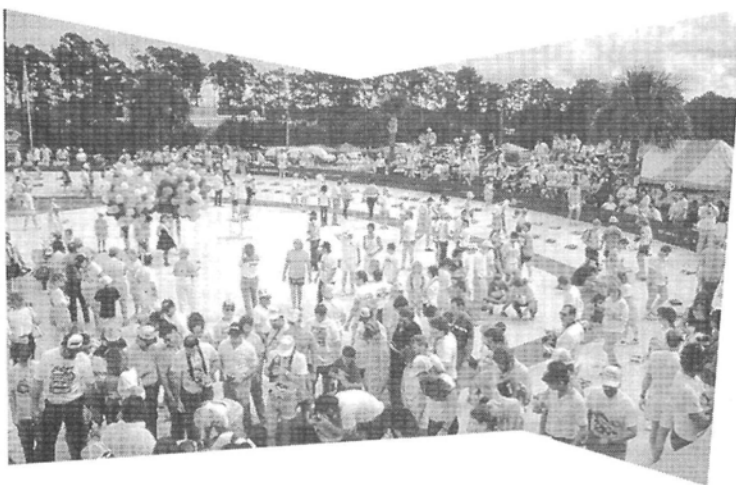


Veni, Vidi, Vici

TRINITY SETS RECORD

We've just received the early results from the big **U.S. Oval Masters** race at Lake Whippoorwill International Speedway—held on the weekend of April 2, 3 and 4. According to our ace contributor John Thawley, the racing action was wildly intense, and it was viewed by at least **2,000 spectators each day!**

Team Trinity's Joel Johnson took command early. He not only TQ'd with Trinity's all-new Evolution Superspeedway car, but he also set a new **track record!** Joel was accompanied by teammates Mike Blackstock and Jim Dieter, and they all qualified in the top five. But when it was time to wave the **checkered flag**, Team Trinity's newest driver, Mike Blackstock, was first across the line. Following him were Chris Doseck driving a Hyperdrive car, and then—in third place overall—Johnson. Look for Thawley's intriguing "Round and Round" race report in an upcoming issue.



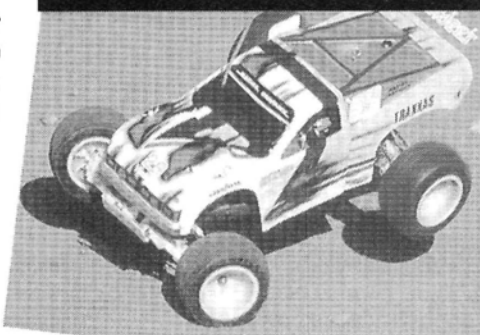
Nitro Hawk

As we were compiling our information for "Racer News," a letter appeared in the *Car Action* office, and we decided that it deserved our immediate attention. If you're having trouble with your Traxxas Nitro Hawk, check out this letter:

"The Image 12 engine in my Traxxas Nitro Hawk has to have its connecting rod replaced more often than the one in my friend's engine. I follow all the rebuilding directions in the engine manual (including polishing the crank journal). I break-in the engine carefully and use a high-quality castor/synthetic-blend fuel with 20 percent nitro. I never run the engine too lean, but it still seems to consume glow plugs and run hot. My friend doesn't have any of these problems with his Nitro Hawk. Do you have any suggestions on what I could do, or can you tell me what I'm doing wrong?—Sam Nasife, Tabernacle, NJ"

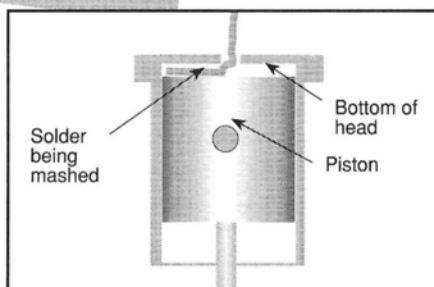
Well Sam, our crack investigative team of Ph.D.s and NASA scientists was somewhat baffled by your problem. Usually, these symptoms indicate that the mixture is too lean, or the fuel has too much nitro for the engine's settings. Omitting to polish the crank journal would also cause premature rod failure, but you say that you follow the directions and are adjusting the engine properly.

When we contacted Traxxas for help, they suggested that you check the engine's compression ratio. Do this by removing the glow plug, inserting a piece of 22-gauge solder into the combustion chamber and rotating the engine through one stroke. Then



remove the solder and use a micrometer or calipers to measure the thickness of the flattened area, which should be no more than to 0.018 to 0.020 inch thick. If it's thinner than 0.018 inch, install cylinder-head gaskets until the tolerance between the piston and the head is correct. Having the correct number of head gaskets is even more important when you use a 20-percent-nitro fuel or one with a higher nitro content. Traxxas emphasizes that you only have to check the

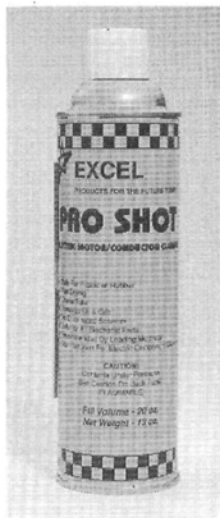
compression when you've tried everything else. In most cases, engine problems can be traced to an incorrectly adjusted needle valve,



incorrect fuel, or worn parts.

Also, if your engine stalls, check the glow plug first. If that's not the culprit, check the gasket between the header and the crankcase. This gasket shouldn't leak; if it does, there won't be enough fuel pressure to pressurize the fuel tank (via the line that connects the header to the tank).

ON THE GO



Excel Motor Spray

I met Mark Kemesky, the national sales manager of Excel Products Inc., in Pasadena, CA, at the '93 IMS show, where he was demonstrating the company's new **Pro Shot** motor spray. According to Kemesky, Pro Shot is ideal for cleaning and de-greasing all electric motors, wires and commutators because it **doesn't leave a residue** or film. In addition, Pro Shot is **ozone-safe** and doesn't contain **chlorinated solvents**.

Part of the demonstration included the spraying of Pro Shot onto the inside of a painted Lexan body: neither the paint nor the body was harmed. I also used it to remove adhesive residue from the front windshield of an off-road body. I was surprised to see that it didn't fog or "haze" the plastic.

For more information, contact Excel Products Inc., 14050 Orange Ave., Unit A, Paramount, CA 90723, or call (818) 788-0675.

In our June issue, we featured a pair of Ed Proctor's magnificent 1/4-scale dragsters. Ed says they've put together a new **race series** for this year, and here are the **dates and locations** of the planned events. If you have any questions, can contact Ed Proctor at (215) 836-5476.

June 6Floyd Bennet Race Track—Brooklyn, NY
 June 19Atco Raceway—Atco, NJ
 June 20Floyd Bennet Race Track—Brooklyn, NY
 July 4.....Floyd Bennet Race Track—Brooklyn, NY
 July 10Atco Raceway—Atco, NJ
 July 18.....Floyd Bennet Race Track—Brooklyn, NY
 August 1Floyd Bennet Race Track—Brooklyn, NY
 August 14.....Atco Raceway—Atco, NJ
 August 15Floyd Bennet Race Track—Brooklyn, NY
 August 29Floyd Bennet Race Track—Brooklyn, NY
 September 12.....Floyd Bennet Race Track—Brooklyn, NY
 September 26.....Floyd Bennet Race Track—Brooklyn, NY
 October 9.....Atco Raceway—Atco, NJ
 October 10.....Floyd Bennet Race Track—Brooklyn, NY
 October 24.....Floyd Bennet Race Track—Brooklyn, NY



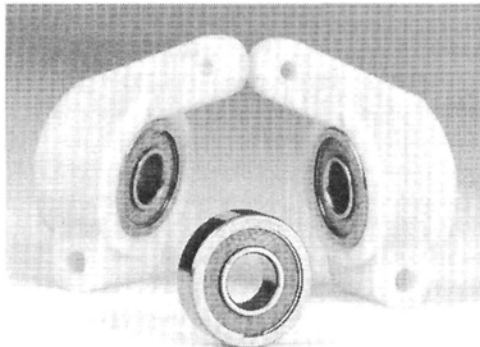
1/4-Scalers Hit the 1/4 Mile

Alliant Engineering RC10 and RC10T Hub Carriers

These hub carriers are **direct replacements** for those used on the very popular Associated **RC10** buggy and **RC10T** racing truck. They allow the use of much **larger, high-precision, commercial-grade ball bearings**, which have a massive **5/8 inch diameter** (stock kit bearings are only **3/8 inch**). Alliant Engineering claims that the larger bearings will significantly reduce rolling resistance and increase load-handling capability, so they're a must for anyone who's converting to gas power.

The hub carriers come with four, heavy-duty, stainless-steel, **double Teflon-sealed** ball bearings, and they're available with 0 degrees of rear toe-in molded into them. Plans include the manufacture of **two types of carrier**: with **1 1/2 degrees of toe-in** and with **3 degrees of toe-in**.

For more information, contact Alliant Engineering, P.O. Box 6473, Aloha, OR 97007-0473.



RACER



NEWS

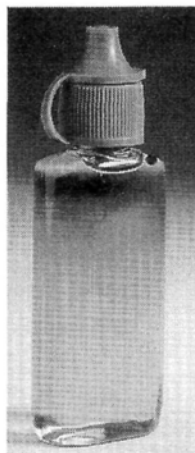
SPEED SHOP

TRINITY/REVTECH Commutator Power Drops

Use the world-famous Revtech comm drops to break-in brushes and increase motor speed. A drop or two on each brush will provide a noticeable increase in horsepower without excessive amp draw. Put one drop on each brush before breaking them in.

Part no.—4040; price—\$3.25.

Trinity Products, 1901 E. Linden Ave., #8, Linden, NJ 07036; (908) 862-1705.



PRO-LINE 1993 Ford Ranger Stadium Body

This new, low-profile, Ford Ranger stadium-truck body is made of durable, clear Lexan. It fits the Losi LX-T, the Associated RC10T and other stadium trucks. It's "performance-tested and race-proven."

Part no.—3071; price—\$19.95.

Pro-Line, P.O. Box 456, Beaumont, CA 92220; (909) 849-9781.



NOVAK ELECTRONICS Updated 410-M1c

The 410-M1c speed controller now includes the exclusive, Team Novak, solid-state reverse-voltage-protection system. This will electronically protect your ESC if you ever plug the battery in backwards, and it eliminates the

need for fuses. To reduce power-robbing voltage drop, the M1c now has huge 12-gauge, silicone power wires. To meet the demands of off-road cars and trucks, its braking capability has been doubled to 100 amps. The BEC has been updated to 6.0 volts/1.0 amp to handle the new FET servos and a variety of servo applications. To provide more consistent braking and improve the efficiency of the motor and speed controller, the M1c now comes with an external Schottky diode.

Part no.—1620; price—\$160.

Novak Electronics, 128-C East Dyer, Santa Ana, CA 92707; (714) 549-3741.



REEDY MODIFIED Schottky Diode

This diode improves braking because it keeps the MOSFETs cooler; it increases the efficiency of today's high-frequency ESCs; and it improves the ESC's regeneration capacity. By reducing the chance that high-voltage spikes will reach your ESC, you'll reduce the wear and tear on it and thus reduce motor wear.

Part no.—745; price—\$5.25 (pair).

Reedy Modifieds, 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342.

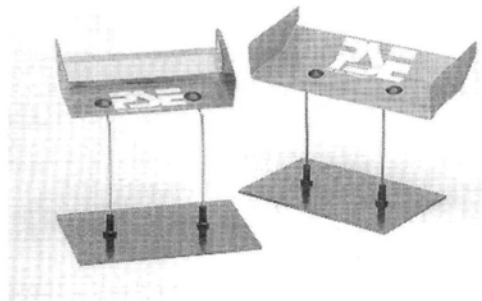
PSE Wings

The dual-element Hot Dam wing (left) is essential for R/C racing. It can be adjusted to one of four levels, to suit your needs. It's molded to protect the side dams and last longer. The new PSE on-road wing (right) provides cars with extra down-force for better rear traction, with only a very slight increase in speed-robbing drag.

Part nos. 99013 (Hot Dam); 99012 (On-Road).

Prices—\$3.75; \$4.95.

PSE, 13927 Progress Pky., North Royalton, OH 44133; (216) 237-8650.



VANTAGE ENGINEERING Digi-Dyno 30

The Digi-Dyno allows both stock and modified motors to be tested at loads of up to 30 amps and with test voltages that simulate track conditions. The Digi-Dyno reads volts, amps, rpm, maximum power output and power in watts (the electrical equivalent of horsepower). Its load is infinitely variable from 0 to 30 amps, and it allows you to monitor the motor's power output and rpm under any load.

Part no.—MS100; price—\$499.

Vantage Engineering, 681 Main St., Waltham, MA 02154; (617) 894-8694.

TAMIYA Dyna Storm

Tamiya breaks into the world of high-level competition racing with the Dyna Storm. This 1/10-scale 2WD car has a compact transmission, several suspension positions and universal drive shafts. You can change the spur gears without altering the slipper-clutch settings. It also has oil-less-bearing bellcrank steering, a low-friction tranny, stainless-steel adjustable turnbuckles, a spring-steel servo-saver, 11 stainless-steel sealed ball bearings and super-strong front hub carriers. Its double-deck chassis is made of ultra-rigid woven fiberglass reinforced with epoxy resin.

Tamiya America, 2 Orion, Aliso Viejo, CA 92656-4200; (714) 362-2240.

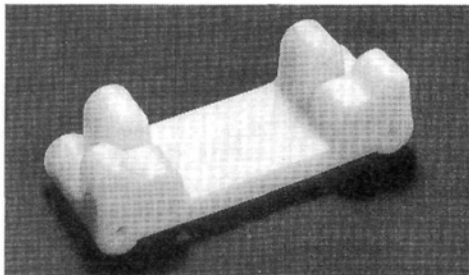


C&M/TEAM COBRA Lathe Conversion Kits

C&M/Team Cobra now offers conversion kits for both stock and modified lathes. Use the 2000M kit (shown) to convert the modified lathe into a stock lathe; use the 2000T kit to convert the stock lathe into a modified lathe. The kits include carbide cutting tools, pulleys, belts and all the necessary hardware.

Prices—\$109.95 (2000M); \$99.95 (2000T).

C&M/Team Cobra, P.O. Box 701-353, West Valley City, UT 84170; (801) 250-9792.



RPM Ultra Molded Chassis Front Bulkhead

This bulkhead for the RC10T and Worlds Car is molded of a tough, durable, nylon-resin compound. There's more material around the screw holes, so you can tighten the screws without fear of stripping the bulkhead. The hinge-pin holes are snug, so only the arms rotate—no excess play. This durable, white, dyeable, front bulkhead allows slop-free, predictable movement.

Part no.—8036; price—\$7.95.

RPM, 14978 Sierra Bonita Lane, Chino, CA 91710; (909) 393-0366.

Descriptions of the products shown on these pages were derived from press releases supplied by manufacturers and/or their advertising agencies. The information given is neither an endorsement of the product by Radio Control Car Action, nor a guarantee of performance or safety. If you write to the manufacturer about any product described here, be sure to say that you read about it in Radio Control Car Action.



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CAR OF THE YEAR

(Continued from page 23)

Previous Kyosho gas cars had metal-sealed ball bearings. These worked well, but the metal shields had microscopic gaps between them and the bearing races, and this allowed small particles of dirt to penetrate the bearings and accelerate wear. The Inferno has rubber-sealed ball bearings that are virtually maintenance-free, and they last much longer.

ENHANCED PERFORMANCE

An independently adjustable dual-disk brake system replaces the Turbo Burns' old, single-disk arrangement. It allows more precise, more powerful braking, so you can drive the Inferno harder and faster into the corners.

The Inferno's suspension is what makes it stand out from its predecessors. Kyosho has taken what it has learned from its 1/10-scale, electric, 4WD buggies and has applied it to the Inferno. The result is a fully adjustable, 4W independent suspension that allows you to tune the car to almost any track condition.

Aluminum-bodied, oil-filled shocks in the front and rear help to smooth out the bumps. The shocks are fitted to redesigned shock towers that provide several mounting positions, so you can change damping characteristics by varying shock angle. You can set camber and toe-in by lengthening or shortening the upper camber link and the steering tie-rods; and, in the rear, Kyosho has included three different rear-arm supports so that you can change the rear toe-in angle. This allows you to control how the car tracks when it exits turns and when it accelerates down the straights.

The Inferno's drive system features a mid-mounted center differential that has a unique "limited-slip" capability that allows you to adjust its operating friction and tailor the way in which it delivers the engine's power. Bevel-gear diffs—one up front and one in the rear—provide smooth, consistent power transfer to the wheels. Many Team Kyosho drivers have experimented with diff "loading" by packing their car's diffs with silicone fluid of different viscosities. This changes the way in which the diff operates by altering its resistance.

GREATER THAN ITS PARTS

The Inferno wasn't chosen as Car of the Year because of its performance alone. Yes, the Inferno is fast, but there's more to it than speed. The Inferno has "carried the torch" of 1/8-scale gas racing in the U.S., and this has helped to bring the fun and excitement of nitro-powered R/C cars to the masses.

(Continued on page 104)

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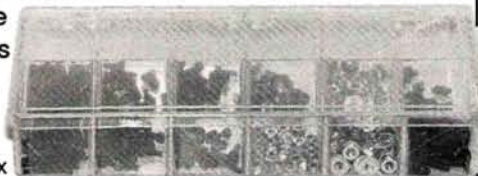
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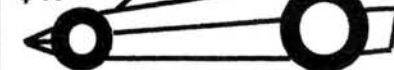
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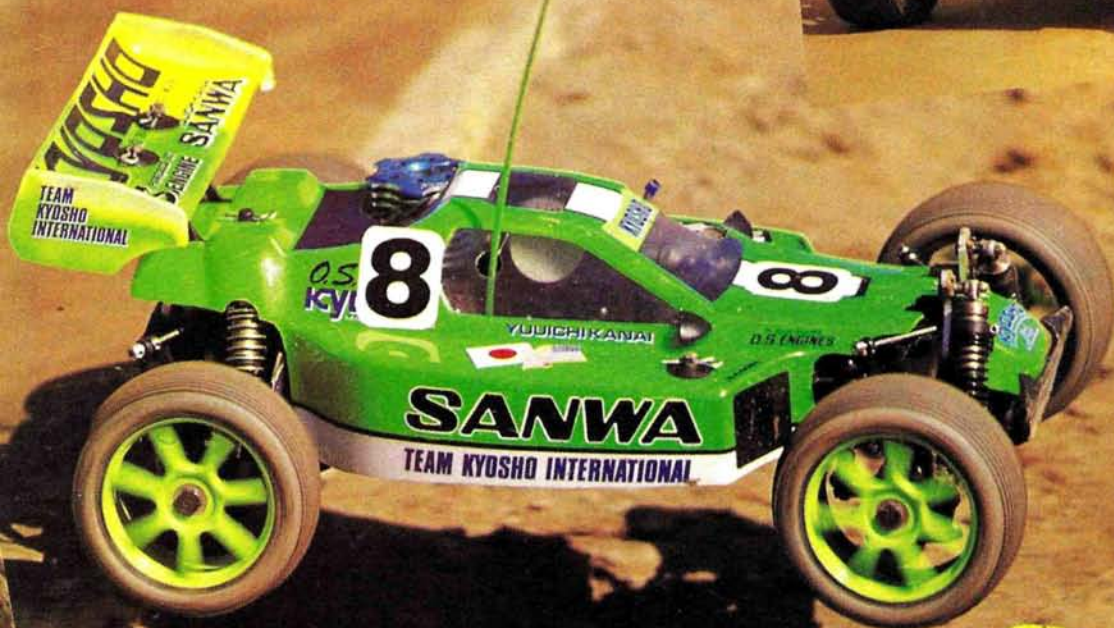


Radio Control
CAR ACTION
KYOSHO

gas Challenge

**Racin'
fumigation**

by JOHN HOWELL



PHOTOS BY JOHN HOWELL



GUESS YOU could say that I'm a pretty lucky guy. I get to go to all the hottest R/C races across the country, see all the stylin' equipment and hang with the top racers. I've covered a lot of races this past year, and after seeing all types of racing action, I have to say that off-road gas racing is one of my favorite scenes.

I'm always stoked to go to a gas race. Seeing an 1/8-scale buggy blaze down a straightaway at 45 to 50mph with its engine screaming is definitely something that you should check out if you get the chance. Fortunately for me, I was heading to the Kyosho Gas Challenge in Hemet, CA.

As a bonus, one of my extremely obnoxious and outrageously funny co-workers, Dan Grathwohl, was coming with me to race his new Mugen car, and I knew we were going to have a good time.



FULL COVERAGE

When we arrived at the track, we met up with the racers while they were practicing. Then, I walked the pits to see what everyone was running. I spotted some new, really trick MIP products that Eustace Moore was running on his Pirate and his Traxxas Nitro Hawk. Keep your eyes open for hot new items from him!



Broadway Productions was on hand to film the race. This video truck chased a few of the 1/8-scale buggies around the track to get a better feel for the action! The clips will be tossed in throughout the coverage, which includes interviews and hot racing action.



Team Mugen 1993

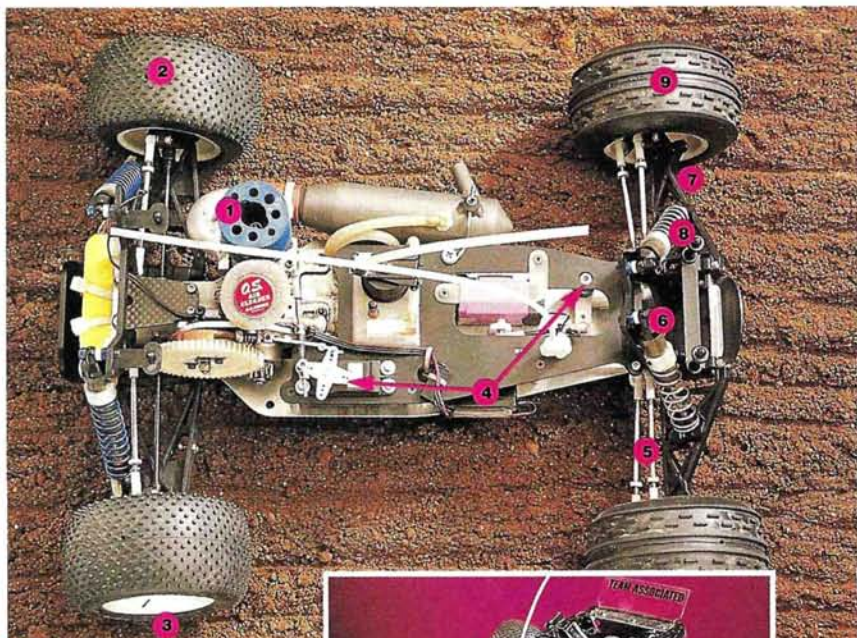
Kunio Dudgeon and Rich Boomsma from A-Main Racing were there, lending a helping hand to people who were running their trucks. For the Hemet race, Team Associated



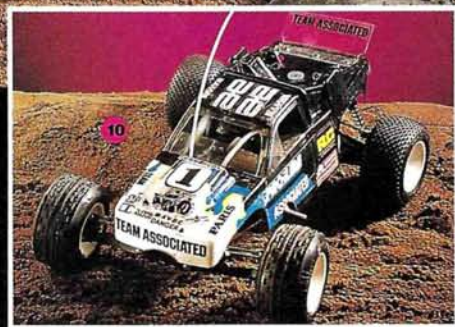
Above: two of Cliff Lett's buddies showed up to check out the intense racing action: Damon Bradshaw (left) and Doug Dubach (right) are motocross racers and teammates for Team Yamaha. Cliff worked as a factory mechanic for Yamaha before he came to Associated. Look for an "Associated/Team Yamaha Factory Ride" article in our '93 Radio Control Racer special. ■ Left: we'd be happy to TQ the truck class, but we're not sure that we'd jam three hot dogs in our mouth at once, like Greg Hodapp did.



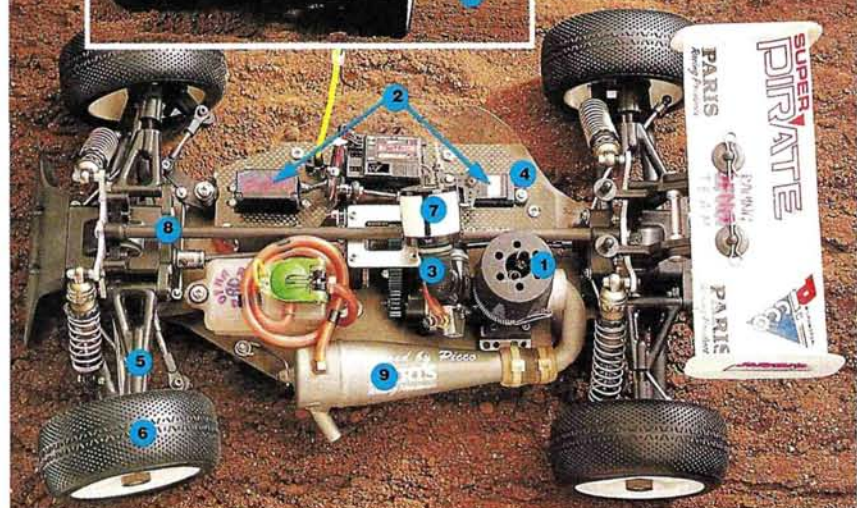
had acquired quite a few of the A-Main Racing/Dudgeon conversion kits for their drivers, and it was rumored that the trucks would be used for R&D. Team DuraTrax was on hand with their gas trucks; they're a force to be reckoned with! The all-new Kyosho Inferno ST (Stadium Truck) debuted at the race. It's good to see that manufacturers are really getting behind the gas division, and are supporting it wholeheartedly. Now, it's time to qualify...



**BRIAN KINWALD'S
Winning A-Main/Dudgeon Racing truck**



**CHRIS MCELROY'S
Winning OFNA Pirate M3**



1. .12 O.S. CZ-R engine (modified by Curtis Husting)
2. Pro-Line XTR 90s
3. New, one-piece, Associated wheels
4. Airtronics 151 servos
5. RCPS titanium turnbuckles
6. Modified shock tower (front and rear)
7. New Associated suspension arms (front and rear)
8. New pistons in shocks
9. Pro-Line XTR 65's
10. New Associated narrow truck body

1. Paris Picco engine
2. Airtronics radio gear (152—steering; 151—throttle)
3. One-way bearing in center diff
4. OFNA graphite radio tray
5. Thorp stainless-steel dogbones
6. OFNA fuzzy pin-spikes
7. OFNA foam cage air cleaner
8. Aluminum front and rear diff cases
9. Paris tuned pipe
10. Polycarbonate M3 body with OFNA Hard wing

QUALIFYING CONFUSION

On Friday, the first round of qualifying went without a hitch, but trouble arose on Saturday. Storm clouds rolled in and raised hell over the track. It poured rain for a while, but the racers finished the second round anyway. Cars were coming off the track weighing between 14 and 15 pounds. Consider that an 1/8-scale car hits the track in race form at around 7 pounds and you'll have an idea of what the track conditions were like!

With the track under water, there was nothing for Dan and I to do that night but go to the Mickey

Thompson Grand Prix in nearby Anaheim! If you've never been to an MTGP, check it out if you're ever on the West Coast; you'll love it. It's full-size off-road racing at its best.

Anyway, back to the race. In the rainy second round of qualifying, Doug Von Mosch took command with his fresh-from-the-oven Inferno; he went out and TQ'd with it. Directly behind Doug was Chris McElroy. Chris, who had only raced his car once before, was only .04 second behind. Pretty close, huh? In the truck division, Greg Hodapp took control with his A-Main/Dudgeon Racing 10T.

Car Action contributor Jeff Bronstein got a chance to talk with famed engine expert Ron Paris. Here's how it went.

JB: Ron, what the heck are you doing here in Hemet, CA, at an off-road race? Everyone knows you're an on-road wizard. What's the deal?

RP: We're out here pretty much to help out a lot of customers. We have a lot of customers here, and Jim and I are just doing motor tuning and overhauls if they need them; and learning. I mean, this obviously is growing very rapidly, and with all the backing of some of the major distributors and importers, it's a growing segment. We're having some fun, but we're learning.

JB: There are a lot of Associated guys out here. Are you helping them, or is one group of racers getting your Midas touch?

RP: Actually, I'm helping somewhat with the 1/10-scale truck program—mostly clutches and pipes and that sort of stuff. We have a few modified 1/10-scale motors here. We're testing them.

I'm here to help a lot of guys. The Kyosho guys: Jack [Johnson] and Kris Moore. They're running our Picco engines. Then some of the other guys are running the O.S. engines. The Duns [Mike and Steve] are running the modified O.S. engines. So, we're here to lend them a hand as well as the Pirate team, the Crono team, the Lauro team. It doesn't matter; we're kind of impartial here. We're here to help everybody. We're here to have some fun and just be of some service if we can be.

JB: Mike Swauger, the current 1/8-scale on-road national champ and Paris Racing team member is here. How is Mike doing, and what do you expect from him with this new car?

RP: I think Mike is an excellent driver. He can drive anything. He's very competitive in 1/10-scale electric trucks now, especially up north in California. He might not be noted for it, but his driving talents are unsurpassed. He's also here to help me test the cars. We're testing a bunch of pipes and motor combinations.

It's unfortunate that Ralph [Burch] couldn't make it, but he had a job commitment and couldn't get away. We're kind of struggling with the 1/8-

RAPPIN' WITH RON



scale gas car, but the 1/10-scale truck seems pretty good.

JB: Ron, why don't you tell me a little about the car you're running here. It's not something I've seen before.

RP: There are a lot of different styles of cars out here. This car is made by Lauro in France. It's a little different, and I'm not sure it's suited to American tracks. In Europe, it's very popular to run on grass surfaces, and there really aren't a lot of jumps. It's more like what we would call a motorcycle "T.T." [Tourist Trophy] track. They don't need a lot of suspension travel, and it's very high traction. So, this car is not quite right for our conditions, but we're fiddling with it.

It's a very nice car. It's got some neat features. It's got a very low center of gravity; it's got three open gear-type differentials, meaning they're not limited-slip. It has easily changeable sway bars and it's very easy to work on. It's also lighter than most of the cars out here.

The Kyosho cars have some nice features where you can change the camber rise, and they have a center adjustable diff, which really helps on different track conditions. The Pirate car has an optional one-way central diff, so it's very helpful, especially when it's loose. The Mugen cars are all running very well. It's really going to be a tough race out there. A lot of guys are running really well.

JB: Many racers know you as one of the foremost authorities in engine tuning and high-performance modifications. What engine are you using in this car, and why is it hot?

RP: This is actually the standard Picco P-5. The EXR is a bit more costly and it does make more power, but we just feel we don't need it at this point. We're really overpowered. The Picco engine is a little unusual. This particular engine uses an investment-cast case, instead of a die-cast case.

This allows you to use much better alloys and then hold a better expansion coefficient.

One of the critical things that most people don't think about is the fit between the outside of the [cylinder] liner and the i.d. of the case. When the case starts to expand and get irregular, it puts force on the sleeve, and they'll distort or expand at unequal rates. The other thing is that you'll get leakage around the cylinder from the ports—literally exhaust being pulled back around the sleeve. These sleeves fit with a very light pressed fit, and they stay that way even when the engine is hot.

JB: Of course, this is your pipe. How is the combination working on the off-road track?

RP: In on-road, we have a different pipe configuration. This pipe adds a tremendous amount to torque and hits better in the mid-range. These cars—they say they have a 5 1/2-pound minimum, but I don't think there's a car here that weighs less than 6 1/2 pounds. That's a lot of weight to accelerate, so it takes a tremendous amount of torque, and that's when this type of pipe comes in. It adds that bottom end without sacrificing any top end.

In on-road, it's actually too violent. It's got too much bottom end with the Piccos, so we run a European-style pipe that has enhanced top end and a little less mid-range. It gives the car a little more driveability. It feels like it has a little less power, but the lap times are better. That's the bottom line—the lap times.

JB: With all the great off-road talent here, who do you think is going to be tough?

RP: There are so many guys here that I'm not even familiar with, but the guys who I personally have helped in the last few weeks—definitely Kris Moore and Jack Johnson—those guys are really unsurpassed in their car setup, and they're excellent drivers. Obviously, the young man from the Mugen team [Sanada]; he's really running fast. Jay Halsey is going to be a factor. I'm sure Cliff [Lett] hasn't had much time on the track, but he will also be a factor. If I had to pick a favorite, though, at this point, it would have to be Kris; just because he's managed to get a little more track time, and I think he's got his setup. I think he's ready.

One truck that sticks in my mind is Mike Swauger's. When he nailed the throttle, his truck looked much faster than anyone else's. Do you think that Ron Paris had anything to do with that? I also checked out Ron Rossetti's DuraTrax LX-T conversion. He had adapted the Hydra Drive system to it, and he thought that it worked really well. There's a lot of trick machinery showing up at the gas races. I wonder what we'll see at the next one?

On an interesting note, none of the people I thought would make the buggy A-Main did! Throughout qualifying, all the top drivers were grouped together, and none of them could get a clean run. Racers such as Jack Johnson, Kris Moore, Cliff Lett, Mike and Steve Dunn, Rick Hohwart and Mick Cradock were in the B-Main. Nonetheless, it was an exciting race to watch, as Jack Johnson took control early on and never looked back. His success must be due

to our off-road rental-car testing at our secret test track the night before...

But, as everyone knows, the A-Mains capture all the glory; and here they are.

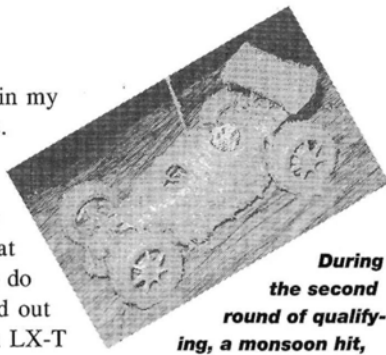
A-MAINIA

The A-Mains were pretty smokin'—no bad combustion puns intended!

Truck A-Main

The 15-minute truck A-Main started with top qualifier Greg

A rebel without Zap-A-Gap! These machines put out some serious ponies, and if everything isn't glued, bolted down, or threadlocked, something's gonna work loose.



During the second round of qualifying, a monsoon hit, and the track was totally drenched. Cars that hit the track at roughly 7 pounds were coming off the track weighing 14 to 15 pounds! Here's a look at Tom Grogg's super-clean Inferno. At least, we think it's Tom's...

MIKEY LIKES IT!



Mike Swauger is one of the best gas on-road drivers in the world. Hemet was Mike's first gas off-road experience. Jeff Bronstein talked to Mike about the race.

JB: Mike, what the heck are you doing here at this off-road race? Everybody knows you're an on-road champ. What's your off-road experience?

MS: I have quite a bit in 1/10-scale electric; both buggy and truck. It seems to help a little bit here.

JB: What's the difference between the electric off-road you're used to and these awesome 1/8-scale off-road buggies?

MS: The off-road I'm used to is smaller—the cars are a lot smaller, and they're quicker—the steering response is quicker. They're not as fast down the straightaway, though. I think this is a lot tougher. Electrics are a bit quicker off

the line, but once the 1/10-scale gas gets going, it's pretty fast! It could be the class of the future!

JB: Do you set up the car basically the same as your other cars?

MS: Yeah, pretty much. But then you have to worry about the jumps and the ruts. This track is pretty good. It's a little small, but it's perfect for the 1/10-scale gas trucks. It's a little bit tight. I'm having some trouble with the triple jump with the 1/10-scale truck. It's just not making it over.

JB: Tell me a little about the new buggy that you're using. What is it, and how is it working?

MS: Well, it's a brand-new car. It's the debut of this car in the U.S. It just came out; it's called a Lauro Rush 4x4. We just now got it figured out. We changed the rear shock setup, and it's starting to come around. The last heat, I was running with all the fast guys, but I ran into a couple of problems—a couple of stop-and-go's. The truck I'm running is the A-Main conversion of the Associated RC10T, and it's running really well. Ron built an O.S. CZ-R .12, with his new pipe, and it's very fast. We're also running the Losi Hydra Drive, and it seems to be working really well.

JB: There are a lot of really good drivers here. Who do you think will be the major drivers in off-road gas racing—and here at this race?

MS: Kris Moore is really fast, and Team Mugen—the Japanese guys are going fast. Brian Kinwald and JD Beckwith are also doing really well. It's going to be tough to make the A. Right now, I'm sitting eighth, and that's with three stop-and-go's and a couple of wrecks, so I think I have a good chance of making the A-Main. I need to keep smooth, have no wrecks and stay out of people's trouble. I also need to keep the pace up.

Kyosho West Coast Gas Off-Road Championships

1/8-SCALE BUGGY

Fin	Qual	Name	Chassis	Engine	Pipe	Fuel	Radio	Tires	Sponsors
1	2	Chris McElroy	Pirate M3	Paris Picco	Paris	O'Donnell	Airtronics	OFNA	OFNA, Horizon Hobby
2	3	Brian Kinwald	Mugen	Paris Picco	Mugen	O'Donnell	Airtronics	Mugen	Mugen USA, Associated, Paris, Airtronics, Novak, RCPS, Reedy, Pro-Line
3	8	Mike Swauger	Lauro Rush 4x4	Paris Picco	Paris	O'Donnell	Airtronics	Kyosho	Paris Picco, Associated, Lauro, Airtronics, Neudy Paint, Alton Airtronics
4	5	Jamie Booth	Kyosho Inferno	Mondial	Kyosho	O'Donnell	Futaba	Kyosho	Kyosho, Ripmax, LRP, RCMC, Hobbico
5	7	JD Beckwith	Mugen	Rex	Mugen	O'Donnell	Airtronics	Mugen	Mugen USA, Com-Tru, Airtronics, Lunstford
6	9	Yuichi Kanai	Kyosho Inferno	O.S. RX-B	Kyosho	K&B	Sanwa	Kyosho	Kyosho, O.S. Sanwa, Automodel
7	10	Tohru Hirao	Mugen	Nova Rossi	Mugen	O'Donnell	Sanwa	Mugen	Mugen USA, Mugen Japan
8	1	Doug Von Mosch	Kyosho Inferno	Paris Picco	Paris	Delta	JR	Kyosho	A-Main Racing, Delta, Paris Racing
9	6	Jay Halsey	Pirate M3	Paris Picco	Paris	Blue Thunder	Airtronics	OFNA	OFNA, Horizon, Airtronics, Paris, Team Losi, Jammin Products
10	4	Kohji Sanada	Mugen	Mugen	Mugen	O'Donnell	Sanwa	Mugen	Mugen USA, Mugen Japan

1/10-SCALE TRUCK

Fin	Qual	Name	Chassis	Engine	Pipe	Fuel	Radio	Tires	Sponsors
1	5	Brian Kinwald	Dudgeon RC10T	O.S. Max	n/a	O'Donnell	Airtronics	Pro-Line	Associated, Mugen USA, Paris, Airtronics, Novak, RCPS, Reedy, Pro-Line
2	1	Greg Hodapp	Dudgeon RC10T	O.S. CZ-R	Paris	O'Donnell	JR	Pro-Line	Associated, Reedy, Pro-Line, JR Propo, Linsford, RCPS, Paris
3	2	Cliff Lett	Dudgeon RC10T	O.S. CZ-R	Paris	O'Donnell	Airtronics	Pro-Line	Associated, Pro-Line, Oakley, Paris, Airtronics, RCPS, Reece Birtles
4	3	Vince Stolo	DuraTrax LX-T	O.S. Max	Paris	Voodoo	Airtronics	Team Losi	Team Losi, DuraTrax, Voodoo, Novak, MIP, Paris
5	10	Doug Von Mosch	Dudgeon LX-T	Paris O.S.	Paris	Delta	JR	Associated/Losi	A-Main, Delta, Paris Racing
6	9	Ron Rossetti	DuraTrax LX-T	Paris O.S.	Paris	Voodoo	Futaba	Team Losi	Team Losi, DuraTrax, Futaba, Andy's, Paris, Skull Racing, Voodoo
7	7	Curtis Husting	Dudgeon RC10T	O.S. CZ-R	McCoy/Paris	O'Donnell	Airtronics	Pro-Line	Associated, Airtronics, Pro-Line, Paris, O'Donnell, RCPS, C&C Specialties, Oakley
8	8	Holli Bechard	DuraTrax	Paris O.S.	Paris	O'Donnell	JR	Team Losi	DuraTrax, Team Losi, Paris Racing, JR Radios
9	4	David Campbell	Dudgeon RC10T	O.S. Max	McCoy	Delta	KO Propo	Associated/Losi	Delta, A-Main Racing
10	6	Mike Swauger	Dudgeon RC10T	Paris O.S.	Paris	O'Donnell	Airtronics	Pro-Line	Associated, Paris, Airtronics, Pro-Line, RCPS, Neudy Paint

Mugen's Asian Assault Team

For the Hemet gas race, Mugen USA flew in its top guys from the Far East to do battle. Yes, that's right, it brought the big guns, the high rollers, the hitmen, the head honchos...well, you get the idea. Anyway, we got a chance to find out more about them. From left to right are:



Stephen Ko: Stephen is the only racer from Hong Kong, and he tells us that 1/8-scale off-road gas racing is the most popular class in his country. His father owned a hobby shop, and that's how he became interested in racing R/C cars. The tracks he races at are built by what he calls "associations," and they encourage new drivers. Stephen also told us that he enjoys reading about American drivers like Joel Johnson in *Car Action*.

Tohru Hirao: Tohru is one of the two Mugen drivers who made the A-Main in Hemet. He commented that while Japanese tracks are larger than American 1/8-scale off-road tracks, they're relatively the same, design-wise. Tohru also qualified for the A-Main at the '92 World Championship race in Germany. He's a relative newcomer to the Japanese Mugen team, but he's a very fast, consistent driver.

Kohji Sanada: At 14, Kohji started designing cars at computer school. He was instrumental in designing the Mugen car, and this was his first visit to the United States. In his own words, "Everything is very wide." Sanada is a world-class racer, and he's the '90-'91 1/8-scale World Champion and the '90-'91 Japanese 1/8-scale Off-Road National Champion. He also TQ'd at the '92 World Championships in Germany. He's considered by some to be the fastest 1/8-scale off-road racer right now.

Steve Hiraoshita: Steve is the overseas team manager for Team Mugen. His job is to prep the cars for racing. At the '87 IFMAR Off-Road World Championships, Steve was Masami Hirotsuka's team manager.



Even though he's the on-road gas king, Mike Swauger took some time to give off-road nitro racing a shot. Here's Mike's A-Main/Dudgeon Racing 10T rounding one of the sweeper turns.

Hodapp heading the pack, with Cliff Lett, Vince Stollo, David Campbell, and Brian Kinwald in pursuit.

As the tone sounded, Hodapp pulled the holeshot with his A-Main/Dudgeon Racing gas truck. He led into the first turn, followed by Lett and Kinwald. After a few laps, Kinwald sneaked past Lett and began to reel in Hodapp. Lett dropped back a few places, and it was time for Vince Stollo and Swauger to dice for third position. By this time, Kinwald had passed Hodapp, and they began to lap the rest of the field.

(Continued on page 104)

Below: more and more people are becoming hooked on gas racing. Almost as soon as a race is announced, the class limits are reached.



When you attend a big race, you usually keep your eye on the top racers, right? You know who the fast ones are; they're the ones who you're always reading about in the magazine! OK, with that in mind, think back to one of the biggest R/C racing shockers of all time—Masami Hirotsuka at the '87 IFMAR Worlds in England. Masami took a box-stock Schumacher Cat XL, built it the day of the race, and then proceeded to win the 4WD A-Main. Pretty impressive stuff, huh?

Why the history lesson, you ask? Well, it just so happens that there was a upset in the making at the first gas race of '93. It may not be as impressive as Masami's surprise win in England, but for Doug Von Mosch, top qualifying in the 1/8-scale buggy class—while battling against the likes of Cliff Lett, Jack Johnson, Kris Moore and a ton of other top racers—was a major accomplishment. I caught up with Doug and ran a few questions by him:

Doogie: When did you first become involved in R/C racing?

Doug: Roughly about 3 years ago.

Doogie: What was your first car?

Doug: [laughs] It was a Tamiya Frog!

Doogie: Tell me about your impressions of the racing scene here.

Doug: It's really fast and very competitive. You've got to have your stuff together to do it.

Doogie: When did you become involved in off-road gas racing?

Doug: About 3 months ago. I work with Rich Boomsma at A-Main Racing, and he got me into it.

Doogie: I heard that this is your first 1/8-scale gas car; is that true?

Doug: Yes, this is the first 1/8-scale buggy I've owned. It's almost box-stock, except for the brakes and the turnbuckles.

Doogie: Tell me a little bit about how you got your buggy.

SNEAK ATTACK

DOUG VON MOSCH NUKES 'EM ALL

Doug: Well, I went to the Detroit gas race with Rich, and the first time I saw the 1/8 scale buggies, I went up to Kyosho's Bill Jeric and bought one. I came back and built it, and I got it together about a month before this race. This is the first time I've run it.

Doogie: This is the first time you've run it?!

Doug: This is the first time it has ever hit a track. I fired it up at the store, broke it in, and ran it around the parking lot a while, but that's about it.

Doogie: That's very impressive, considering what you've done here today.

Doug: Yeah, with almost no experience racing this thing, I went out in the second round and TQ'd with it. I waited around until [Jack] Johnson and those other guys left, and I lifted up their bodies and looked at their cars. Then I came back, made a few changes to mine, and off it went [laughs].

Doogie: How do you feel going into the A-Main?

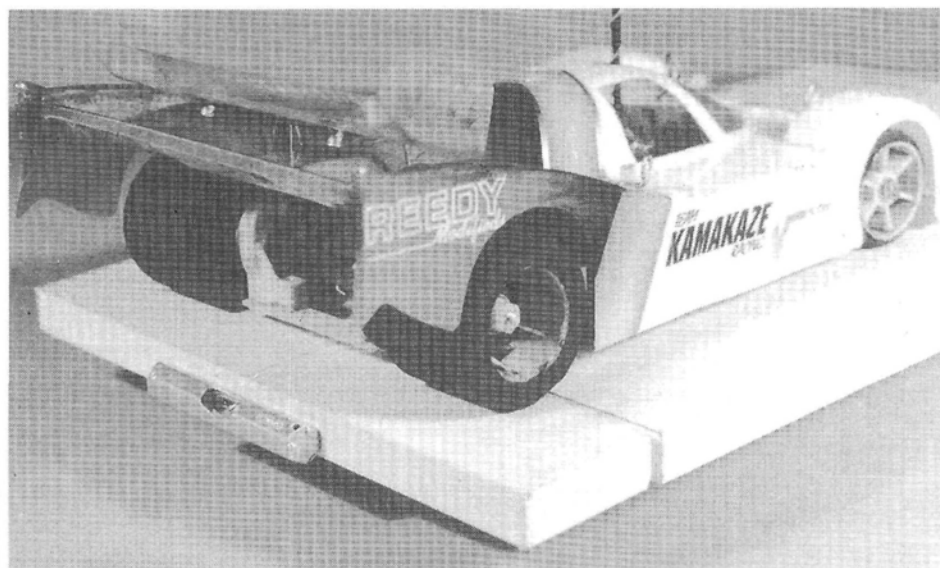
Doug: [laughs] I'm gonna teach 'em something. I'm going in there with no really big sponsors; you could say that I'm going in there as a "nobody," and, hopefully, I'll come out a "somebody."

Doogie: Do you have any sponsors?

Doug: Just Rich at A-Main Racing, and Ron Paris just picked me up too, so that's cool.

Doogie: Well, it looks like you're gonna be coming to a few more gas races with Rich from now on, don't you think?

Doug: I think so!



The easy-to-make bubble-level tweak board is great for balancing an on-road car. This particular size and style of board can handle almost all 1/10- and 1/12-scale on-road cars.

Make your own Tweak Board

by MIKE LEE

homemade balancing act

BALANCING A CAR correctly and making it handle well can be very trying. For on-road cars, balance—or “tweak”—is critical. If it’s “off”—even a little—the car will handle poorly. Many roadcourse drivers use a “tweak board” to help them balance their cars, and it isn’t difficult to make.

I made a tweak board about four years ago, and I use it to check the tweak of my 1/12- and 1/10-scale cars. There are other designs, but this one is easy to make and costs less than \$12.

As you’ll see from the list of materials, some of the parts, e.g., the bearings and the kingpin, are used car equipment. Hardly anyone now uses bronze Oilite-type bushings (they’ve all been discarded in favor of ball bearings), so you should be able to find a few unwanted ones. The kingpin may be well-used, but it shouldn’t be bent.

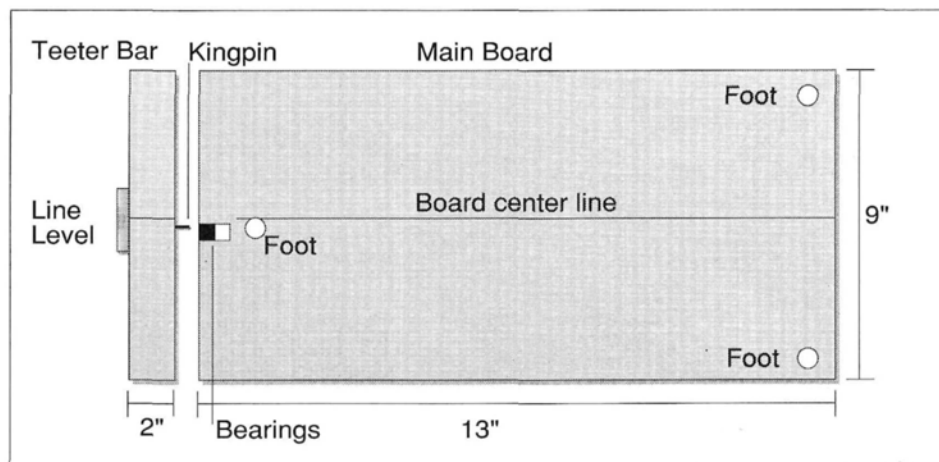
MATERIALS

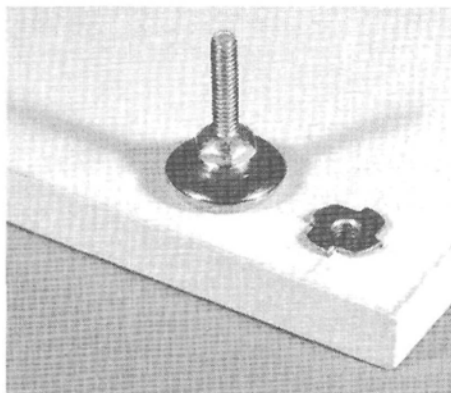
- 9x24-inch laminated shelving (or similar). Use a wider piece if you prefer.

- bubble-type spirit level
- 3 adjustable, 1/4x20 threaded-tip, table or chair casters
- 3, 1/4-20 threaded blind nuts
- 2, 1/8-inch-i.d. (3/8-inch-o.d.) bearings (no flange; same as those used in modified motor cans), or an 1/8-inch-i.d. (3/8-inch-o.d.) bronze Oilite bushing, (like those in the front wheels of most road cars)
- new or used 1/8-inch kingpin (like those in most R/C car front suspensions)

GET TO WORK

- Cut the shelf to size. Measure at least 13 inches from one end, and draw a line across it. (A 13-inch board will be big enough to take any road car.) Measure 2 inches from the other end and draw another line. (This measurement isn’t critical.) Using a table saw (or another type of wood-cutting tool) with a very fine blade, cut the board along the lines you’ve drawn. (A fine blade ensures a smooth cut through the plastic.)
- To build the tweak board, we need only the 2-inch piece and the 13-inch piece. Carefully sand the cut edges of the board pieces to make them smooth and even.
- On both ends of each board, carefully measure

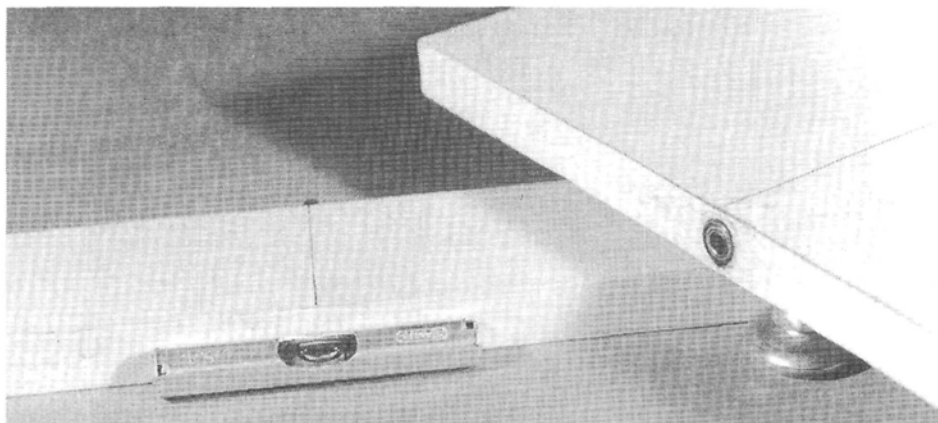




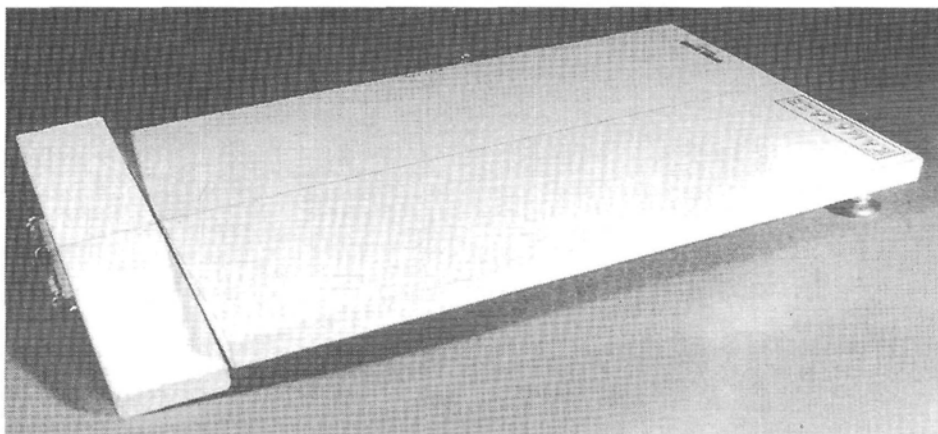
The main board has three adjustable caster feet, one of which is mounted at the end near the teeter bar.

and mark the center point; then use a fine-tip permanent marker to join the marks to show the center line of each board (see diagram). This center line will tell us where to drill a hole for the bearings.

- On the sawn end of the longer board, continue the center line down over the edge.
- Now draw a line at the exact center of the board's thickness. You'll have two lines that cross exactly in the middle of the end of the board.
- At the point where the lines cross, drill a $\frac{3}{8}$ -inch-diameter, $\frac{3}{4}$ -inch-deep hole.
- Press the bearings or bronze bushing into the hole. If you use bearings, you'll need two; the second one will be flush with the edge of the board. If they fit loosely, use a Super Glue-type adhesive to hold them in place.
- Push the kingpin as far as possible into the bearings.
- Put the end of the narrow piece of board—it's now a teeter bar—exactly against the end of the main board where the kingpin sticks out. Use the kingpin as the reference point to tell you where to drill a $\frac{3}{32}$ -inch-diameter, $\frac{1}{2}$ -inch-deep hole in the teeter bar. This is the only critical step in the construction of this tweak board; the ends of the teeter bar and main board must match.
- Carefully press the kingpin into the hole you drilled in the teeter bar. It's a tight fit, and you'll have to press hard. Use a *plastic* hammer to knock the kingpin into place; *don't* use a steel hammer. You've now done all the hard work.
- Separate the boards, and flip the larger board over, face down. Using a $\frac{5}{16}$ -inch drill bit, drill the three holes for the feet (see diagram). Drill only halfway through the board.
- Put a 1/4-20 blind nut into each hole. Use a hammer to pound the blind nut into the larger board and seat it completely. If you first put the board on a flat floor, you'll be able to bash it with the hammer without fear of damaging the board's surface.
- Having seated the blind nuts, screw a caster into



With the teeter bar removed, you can see the kingpin and bearings in the main board. The bubble level is glued to the teeter bar while the bar is lying on a flat surface.



The completed tweak board is ready for use. For total accuracy, balance the teeter bar by inserting lead pellets into its lighter end.

each one, but don't tighten them. They should always be loose, because you'll level the board by adjusting them.

- Finally, attach the spirit level to the teeter bar. I glued my level into place with Hot Stuff CA. Run a bead of glue along the level, put the teeter bar on a flat surface, and then stick the level on the teeter bar (both should be resting on the flat surface). I put my level in the center of the teeter bar. Choose your own poison! We're ready to tweak.

LET'S TWEAK!

- First, level the board. Put the teeter bar on top of the board, and adjust the casters until the bubble is centered. Put the teeter bar back into its place at the end of the board.
- Put your fully loaded, ready-to-run car on the board, centering it over the drawn center line and positioning its rear wheels just in front of the teeter bar.
- Straighten the front wheels, and settle the car's suspension by pushing down on the antenna or on the middle of the car a few times.

- Carefully roll the car backwards until its rear wheels are on the teeter bar, and see where the bubble in the level is. If it isn't centered, your tweak is off, and you should make adjustments accordingly. Although the adjustments you make will vary, most are made by altering the car's rear pod in relation to the main chassis—usually, with setscrews or by changing the tension of the shock springs. Simple and fast, the tweak board is also quite accurate.

For total accuracy, I balance the teeter bar by drilling an $\frac{1}{8}$ -inch-diameter hole in its light end and packing this hole with .177-caliber lead pellets until the teeter bar balances. If you use a bronze bushing, oil it with a very light oil before you use the tweak board.

When you've learned the secret of car tweaking, you'll find it a lot easier to make your car handle correctly. Having this skill often means that your car comes in first and isn't just another in the pack at the back. ■



CAR OF THE YEAR

(Continued from page 88)

Race-winning performance right out of the box, combined with the factory support from Kyosho USA, makes the Inferno a good buy, even considering its \$679.95 retail price—on a par with the prices of 1/8-scale off-road buggies, but seemingly high for electric racers. But consider this: when you add the price of batteries, a charger, and an electronic speed controller to the price of an average electric-powered buggy, you'll probably exceed the Inferno's retail ticket.

If you've ever run a 1/8-scale off-road buggy, you know how the adrenaline rush feels when that .21-size engine cranks up. If you've never driven one of these beasts, I urge you to give them a try. I bet Chianelli's hair that you'll become hooked, too.

*Here's the address of the company featured in this article:

Kyosho/Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826. ■

OFF-ROAD GAS CHAMPS

(Continued from page 97)

David Campbell had sneaked up and claimed third place, while Kinwald was out front with a 7-second advantage over Hodapp. Lett had moved into third, with a hard-charging Mike Swauger right behind him in fourth. Ron Rossetti began to pick up the pace, and he looked as if he would move up in the standings rather quickly.

At the halfway mark, Kinwald pulled into the pits to fuel up, and that's when a tech official notified race director Bill Jeric that Brian hadn't taken his truck to tech to have his fuel tank inspected before the race. A quick inspection after the race would determine whether his truck would meet tech approval.

By the time Kinwald left the pits, he had an 11-second advantage over second-place Hodapp. Campbell was sitting comfortably in third, with Lett in fourth.

It looked as if Hodapp might pull the win out of his hat, as he had closed the gap to a 6-

(Continued on page 120)

and racing

1/8 & 1/10 SCALE GAS

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Porsche 959	479.95	Rossi 8 Port	179.95	REX Paris Pipes 1/10	28.95
1/8 OFF ROAD		Serpent 5 Port Rd	239.95	Custom Heatsink	21.95
Inferno DX	Call	Paris/Picco P5	239.95	Duratrax Stage 2 Perf. Head	21.95
Inferno	Call	REX 3 Port	199.95	Lightweight Fly Wheel OS.21	21.95
Inferno ST 4WD Truck	329.95	REX 7 Port	259.95	Lightweight Fly Wheel OS.12	15.99
Pirate M1	269.95	JP Racing Tops (ST)	Call	.12 CZ Pre-Filter 4RM-11	2.79
Pirate M3	429.95	JP Racing Turbo	Call	.12 CZ 2 Stage Filter	3.99
Mugen S.S. 93	449.95	Tops 8 Port	299.95	.21 Pre-Filter CB-110	3.49
Mugen Toyota Truck	389.95	OS 21 RFB & RXB	Call	.21 3-Stage Fit/OS Air Clnr	9.95
Hodr	399.95	MODIFIED		Slide Valve Cab. Kit	44.95
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Impact 10 W/O Engine	299.95	Rex 7 Port	309.95	Enya Plug #5	8.95
Impact 10 W/.12	359.95			Starter Boxes Duratrax	79.95
Impact 10 W/.15	Call	12 & 15 ENGINE		RCM Start Boxes	49.95
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BMT 935 BD W/2 Speed	399.95	LEO 12	89.95	O'DONNELL 20% Racing (Case)	104.95
Out Law Rampage	299.95	Webra .12 ABC	109.95	Blue Thunder (Case)	Call
TRAXXAS Nitro Hawk RTR	319.95	Mega 15	184.95	Blue Thunder (1/2 Gal) Case	Call
DURATRAX CONVERSION KIT (Call)		Mega 15 W/Header, Pipe,		R&R Speed Fuel 20% & 30%	Call
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Gas Conv. Kit RC10T w/motor		R&R RACING PRODUCTS			
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Gas Conv. Kit LXT		Piston Locking Tool	14.95		
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TRUCK STOP

MONSTER MAYHEM

by JOE LEFFELMAN

THE '92 CHICAGO Hobby Show is now history. With something for everyone to see and do, it certainly was big! One of my favorite exhibits was the Tamiya* display: a small track set up to promote the new Clod QD (Quick Drive) R/C truck. Tamiya representatives held races for kids in three age groups, and the winners got to keep their trucks. What a deal—a free truck just for winning a race! What's more, these races exposed more people to the world of R/C, and the kids had fun participating in them. The Clod QD is a ready-to-run mini-monster with 2WD/2WS. For beginners, it provides a good introduction to R/C.

Tamiya also had the Mountaineer at the show. This truck is basically a remake of the Bruiser—one of the most realistic R/C vehicles ever made. It had a 3-speed tranny, an aluminum frame, solid axles, scale leaf springs and big, semi-pneumatic tires.

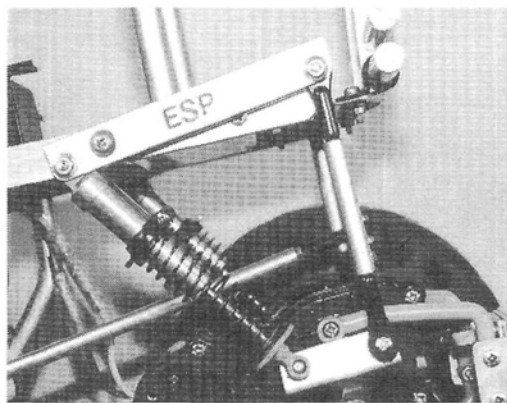
Sassy Chassis* has a new, ultra-light (but very strong) chassis for the Clod Buster. You can use both stock hardware and after-market items—such as Sassy's Clod cantilever shock system—with it. The shock-mounting holes are punched at the factory for easy installation. This chassis will extend your wheelbase, so you'll have a bigger turning

radius and more stable handling.

ESP Manufacturing* also has some new items for us monster truckers. The company's Clodzilla II long wheelbase suspension kit will extend your wheelbase 3 inches. It comes with 10 aluminum rods: eight for the suspension and two for steering. Rocket City* ball ends and mounting materials are supplied, and the kit's easy-to-follow instructions make installation fast.

The longer wheelbase will increase your truck's turning radius, improve its handling and, depending on your shock setup, lower the Clod's ride height. That lower center of gravity should improve handling even more. Since your shocks will be angled, they'll work at a more progressive rate, and this will improve suspension action.

The longer wheelbase also makes the truck seem more flexible. What I mean is this: if you hold a stock Clod by each gear case and slowly twist the suspension, you'll notice that the stock suspension setup doesn't allow the chassis to roll too much. The ESP kit improves this

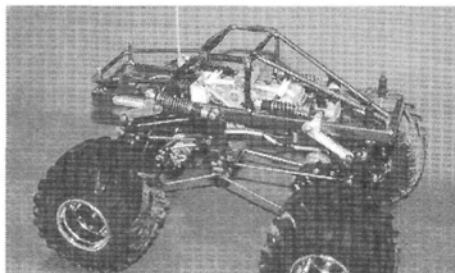


Here's a close-up look at ESP's Clodzillalever floating shock system.

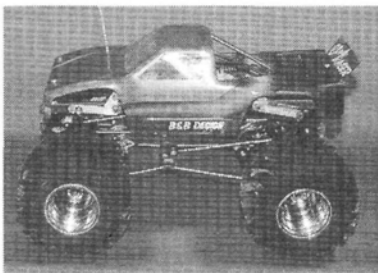
greatly. It keeps the Clod's tires in better contact with the ground during cornering, so it's less likely to flip over; it should have a smoother ride, too. And call me crazy, but I like the way this kit makes the truck look a little more like the real thing. Just check out any of the latest monsters, such as the Bigfoot, the Bearfoot and the Gravedigger, and you'll see what I mean.

ESP also introduced its new Clodzillalever floating shock system, which was designed to be used with the ESP long or standard-length, ladder-frame racing chassis and the multi-link suspension. Its floating-shock design creates a rising-rate action in the suspension that improves handling. The kit causes the shocks to work in a slightly

unusual way. In most systems, the shocks are mounted in fixed positions. In the ESP kit, the shocks are still fixed, but each one is connected to a pivoting aluminum bar on the chassis. Next to the shock, a rod is connected to one end of the bar and to the axle. When the shock is compressed, the bar pivots with it; at the same

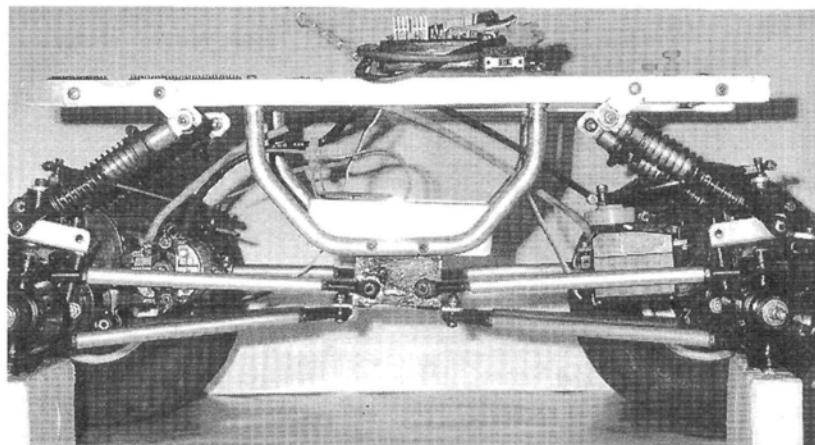


B&B Design's Clod chassis is made of C-channel 6061-T6 aluminum. The stainless-steel suspension has a four-link design.



time, the rod pushes the other end of the bar down and pulls the shock back up. It might sound a little confusing, but it's really quite simple. The pressure on the shock in both directions—pushing down and then pulling back up—causes a floating action. You can feel this if you place your hand on the center of the truck's top and push

6061-T6 aluminum, the chassis will allow the truck to sit lower than a box-stock truck, but with 2.5 inches of travel. The stainless-steel suspension will have a 4-link design. Damping will be provided by their own cantilever system with 6061-T6 aluminum arms. An aluminum roll cage—just like those on the full-size monsters—



This is ESP's new, long wheelbase suspension kit. Notice the angle of the shocks; the way you mount your shocks determines the angle. On my Clod, I use the top half of ESP's old racing suspension kit.

down as you move the chassis back and forth and from side to side. This system has a constant rising action so it provides more damping on big jumps and less on smaller ones.

During the show, I talked to Mark McFadden—NR/CTPA* (National R/C Truck Pulling Association) president. The NR/CTPA—with more than 60 affiliated clubs and members from across the country—puts on many truck pulls and monster-truck races. Last year's World Championship—with more than 300 entries—was held in Montpelier, OH. If you're interested in joining this association, Mark and his friends would be glad to hear from you.

TECH IDEA OF THE MONTH

This month's idea is the brainstorm of B&B Design* (Brian Daugherty and Brian Turner). Ever since their Clodracor won the 1991 NR/CTPA Monster Truck World Championship, they've been working on new versions of their Clod Buster chassis and suspension. They're currently producing a limited number of these chassis for sale to the public. Made of C-channel,

will top off the chassis. The chassis and roll cage will be black-powder coated. A Losi JR-XT body will be included since this is the only body the roll cage will fit. This should be a very durable setup. To complete the truck, you'll only need to supply wheels, tires, gears, gear cases, axles and the electronics. As I said, there will be a limited number of these sold, so if you're interested (I know I am), contact B&B Design; they'll be more than happy to help you. Be sure to tell them you saw it in *Car Action's* "Truck Stop!" Have fun!

**Here are the addresses of the companies mentioned in this article:*

Tamiya America Inc., 2 Orion, Aliso Viejo, CA 92656.

Sassy Chassis, 906 Ridgewood Dr., Cary, IL 60013.

ESP Manufacturing, 20 Crystal Lake Plaza, Crystal Lake, IL 60014.

Rocket City R/C Specialties, 103 Wholesale Ave. NE, Huntsville, AL 35811.

NR/CTPA, P.O. Box 894, Waukesha, WI 53187.

B&B Design, 3063 Wingate Dr. #3D, Kentwood, MI 49512. ■

TEAM LOSI TECH TALK

SHOCK TALK

Remember to keep the outside of your car's shock cartridges clean. Built-up dirt around a cartridge can scratch the shaft and damage the O-rings. The easiest way to clean them is to brush them with an old toothbrush.

Team Losi now offers an improved, after-market shock shaft, which is finished with a special titanium-nitride coating. This extremely hard, polished finish makes the shaft smoother and longer-lasting. The shafts are available for all three shock lengths offered by Team Losi: .6 inch (part no. A-5060), .9 inch (part no. A-5061) and 1.2 inches (part no. A-5062).

TRANNY TIPS

When you build a tranny or when you replace the gears, you should mark one side of each gear with a permanent marker. Then, every time you rebuild the tranny, install the gears so that they rotate in the same direction as they did before. This will result in a better gear mesh that lasts longer.

If you use dogbones in your transmission, periodically check the outdrives for wear. If they show excessive wear, replace them. Check to see whether the dogbone pin has worn a groove in the outdrive. This will impair your vehicle's handling, because the pin will be locked in the groove and won't allow the suspension to move freely. If you use some type of dry lubricant on the outdrive cups and the dogbone balls, the suspension will operate more freely under acceleration.

If your track has very fine, "dusty" dirt, you might want to seal your car's transmission housing with either motor-endbell tape or 1/4-inch-wide tape. Just run the tape around the entire gearbox case. (Cover the seam between the halves.) This will prevent the dirt from getting into the gearbox and damaging the gears.

* * *

Let us know what's going on! Address your questions and problems to Team Losi, "Tech Talk," 13848 Magnolia Ave., Dept. J, Chino, CA 91710.

Bimmer Basher



by A.R. FLATBUSH

SOME OF THE fondest memories of my youth are of the days back in the late '60s when my dad raced SCCA Gymkanas and Bashkanas. We would pack up in Dad's Austin Healey 3000 and head to a local parking lot or airstrip, where the Sports Car Club of America would have set up a serpentine course with pylons. The idea was to get around the course as quickly as possible without knocking down any pylons; and the hot cars were British Healeys, Triumph TR3s and TR4s, and Mini Coopers. They had the best combination of power and handling, while the American muscle cars of the day just had tons of power. Dad would usually win, and he almost always took home a trophy, but the best times were when he would take me along for the ride during practice.

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MERCEDES

190 AMG

Times and technology have changed since then, and the British automotive dominance has been replaced by Japanese performance sedans and European touring cars, like the Mercedes Benz 190E AMG and the Audi Quattro. All-wheel drive has become the new force in sports-car racing; and to such an extent that ruling bodies have had to devise stricter rules and apply massive weight penalties to 4WD cars to maintain a semblance of fair competition. In other words, 4WD rules the road!

So, when I decided to give pavement-pounding a try, it was a given that the car I chose would have all-wheel drive. I didn't want to spend an arm and a leg either, so I chose the Tamiya* Mercedes Benz 190E EVO. II AMG. I figured that it would provide the thrill of SCCA parking-lot racing at an affordable price, and that the all-wheel drive would allow me to smoke more expensive 2WD cars. Besides, Tamiya's Mercedes 1/10-scale 190E looks as good as the full-size touring sedan! If it worked half as good as it looked, I would be driving like Stirling Moss or Jackie Stewart in no time!

WHAT'S IN THE BOX?

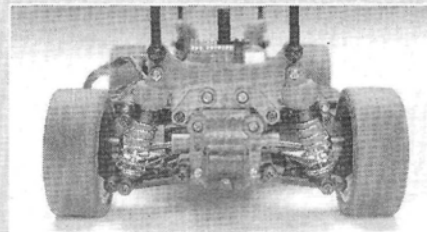
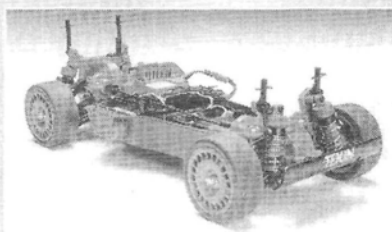
The Mercedes Benz 190E EVO. II AMG kit has the same honeycomb chassis and traverse-shaft-drive 4WD system as the Tamiya Nissan Skyline and Toyota Celica GT-Four Rally cars, and it has many of the same parts as the off-road Manta Ray. It's good to know that the design that went into the road car can survive in the harsh world of off-road racing. Anyway, the kit is well-designed, and everything is contained in handy parts bags and well-marked, plastic parts trees.

The 190E kit has "tunable" plastic shocks that provide 1/2 inch of wheel travel at all ends. You have three choices of shock pistons—one, two and three-hole damping—and the instructions recommend that you use the three-hole setting, which is the softest. The suspension is fairly stiff at the softest setting, but it still allows body roll in corners.

The rear suspension has 2 degrees of toe-in, so it stays planted in turns and it accelerates hard out of corners without spinning. All four rally-style wheels are capped with rubber racing slicks, which provide awesome traction on tarmac and concrete. (You can order treaded radials for other driving conditions.)

The kit includes plastic bushings (5x11mm) for the front gear diff, the out-drives and the rear ball diff, and brass bushings support the spur and bevel gears. I've never been a big fan of plastic bushings, so I ordered two sealed bearing sets (Tamiya part no. 53008) for the differentials and

TAMIYA MERCEDES BENZ 190E EVO. II AMG



Scale1/10
Price\$247

DIMENSIONS:

Overall length17.25 inches
Width7.25 inches
Wheelbase10.25 inches
Front track5.75 inches
Rear track6 inches

WEIGHT:

Gross
(with battery)3 pounds, 7.75 ounces

CHASSIS:

TypeOne-piece tub frame
MaterialPlastic

DRIVE TRAIN:

PrimaryPinion/spur
TransmissionSecondary gear/shaft
DifferentialsFront gear/rear ball
Bearings/bushingsBushings

SUSPENSION:

Type (f/r)A-arm with upper link
Damping (f/r)Oil-filled, coil-over shocks

WHEELS:

Type (f/r)One-piece nylon
Dimensions (f/r)2x1 inches

TIRES:

Front/rearRubber slicks

ELECTRONICS:

Motor540 Mabuchi
Battery6-cell stick pack
Speed controllerRotary

OPTIONS AS TESTED:

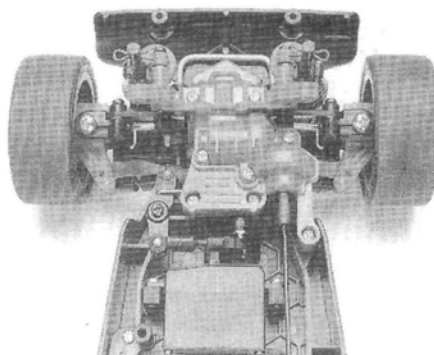
Futaba 2PBKA standard transmitter and receiver; Tekin TSC 408 S ESC; Trinity 1400mAh and Pushed P-170 6-cell stick packs; Speedworks Diamond Gem 12-turn double-wind modified motor; eight 5x11 ball bearings and eight 5x11 brass bushings.

HITS:

• Awesome body and chassis detailing • Easy diff and propeller gear access • Lots of extra parts, including diff gear • Built-in steering-servo-saver • Great handling and acceleration

MISSES:

• Limited gear selection/top speed • Have to remove motor to change pinion • Non-adjustable camber, disassembly for toe-in • Plastic bushings wear quickly • Body decals require experienced and deft hand



Because it's a planetary-gear diff, and it's well protected within the front bulkhead, the front diff should never need servicing. Steering is quick and light, even with a standard servo.

used Traxxas* brass bushings for all four wheel spindles.

The kit also includes a 540 Mabuchi motor and a mechanical speed controller. The speed controller's design is excellent, and it has a Lexan cover that keeps road grit and rubber out of the controller's contact points. The motor drives the spur gear, which drives the easily accessible ball diff via an idler gear. Just four screws hold the rear diff in place, so it's a snap to service. The spur gear also drives the beveled propeller gear, which uses a steel propeller shaft to drive the front planetary-gear diff. It's a clean setup, and you can upgrade the kit with the Manta Ray stainless-steel

propeller-shaft set (see sidebar).

The coolest part of the kit, though, is the body. No one details bodies like Tamiya. The Mercedes 190E EVO. II AMG has a concours interior with a driver, and the exterior has mirrors, a rear spoiler, hot-looking decals and even a Mercedes hood ornament. The wheel wells have been cut for you, and the body-post holes and the antenna holes have been drilled. The kit is every bit as detailed as Tamiya's static-model kits—and you don't have to risk ruining the body with scissors or drills. It saves a lot of time, too!

KIT ASSEMBLY

Before you begin assembly, study the instruction manual carefully. It's written in Japanese, German and English, so it doesn't go into a lot of verbal detail. You have to rely heavily on the schematic drawings, so it's important that you study each step thoroughly—especially intricate steps like the rear differential assembly. I've assembled many a ball diff, so I have a good idea of what goes where, and how to stack the dish-shaped spring washers, but I think that a first-time builder might have trouble getting it right the first time, unless he or she pays very close attention to the pictures.

After that crucial first step, everything else is gravy. The pieces fit together perfectly and, in case you drop a screw or a diff ball, there are plenty of spare parts. Tamiya thought of just about everything! Be sure to keep the parts on the tree or in the bags until you need them, or you might lose something. You'll use screws from Bag A in just about every step, so, to save time, empty the contents of that bag into a small plastic margarine container.

Everything went together without fuss, except that I had to redo the steering once. The instructions tell you to set up the two steering arms with 4mm of rod between the two rod ends. The car had way too much toe-in, so I shortened them to 2mm. (This provided zero toe-in.)

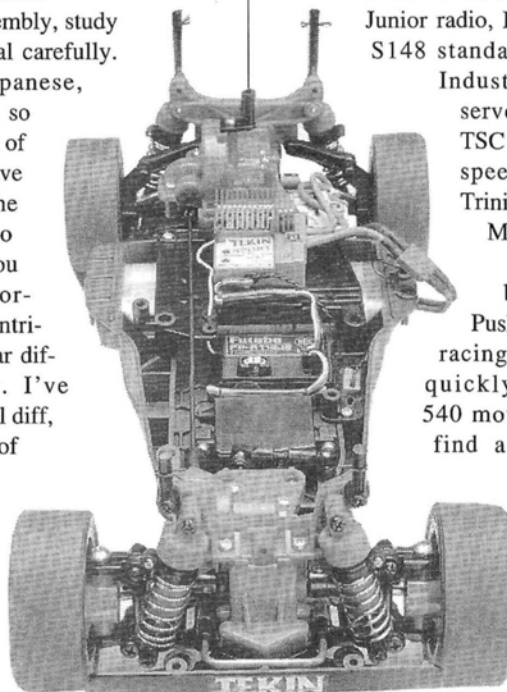
Many parts, like the front and rear dog-

bone outdrives, look alike but are different. To avoid a time-consuming mistake, match each part with the schematic drawing (next to each step's instructions). If you do this, the kit will go together perfectly the first time. Also, pay close attention to grease application. Where grease is needed, the schematic shows a little blue grease gun that points to the part that needs the grease.

It took 3 hours to build the chassis and another 3 hours to apply the decals and to mask, paint and trim the body.

APPLYING POWER

I used a Futaba* 2PBKA Magnum Junior radio, R112JE receiver and S148 standard servo; an LDM Industries* ball-bearing servo kit; and a Tekin* TSC 408 Sport electronic speed controller. I use Trinity* 6-cell, 1400mAh Maxzilla batteries for playing around, but I use a 6-cell Pushed P-170 pack for racing. I knew that I'd quickly outgrow the stock 540 motor, so I wanted to find a budget modified motor that would make things happen more quickly. A Speed-works* Gem Series motor fit the bill nicely; I chose the "Diamond" 12-turn double for awesome punch off the corners.



Everything has its place in the 190E, and the battery is held in place by one quick-release pin. The on/off switch is under the car, recessed in the tub.

HOW ABOUT THAT GREAT BODY?

I was an avid modeler when I was a kid, so I figured that I could make the body look as good as it does on the box. I guess I lost a lot of patience as I grew up, because the decals made me feel like a real goob! Even using soapy water to apply the decals, I couldn't line up the intricate body panels at all ends. Because the AMG 190E uses a two-tone paint scheme, I used spray cans (after I masked off the interior and exterior to prevent overspray from fouling the decals). The Nissan Skyline kit includes decals for the taillights, but you have to paint them on the Mercedes 190E.

There are even decals for the interior's dash and switch panel, and helmet decals for the driver. When the paint was dry, I clipped

HOP-UPS FOR RACING

Because so many Tamiya cars share the same 4WD system and chassis dimensions, there are a number of hop-up options for the Mercedes Benz 190E EVO. II AMG, including the Toyota Celica GT-Four off-road rally body and the sleek Nissan Skyline body. You can even upgrade the drive train and the chassis with Manta Ray off-road parts.

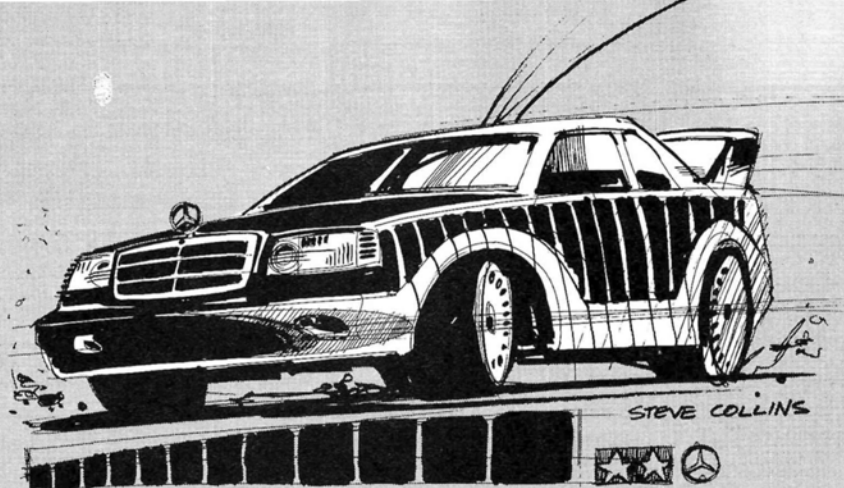
I wanted a little more top speed and versatility from the 190E, so I installed Pro-Line* Striker III Indy Profile AC-53 tires on all four wheels. The taller tires increase overall gearing slightly and allow the car to hook up on sandy parking lots (such is life when you live in the desert!) and dirt ovals. The AC-53s don't hook up quite as well as the stock slicks on clean asphalt, but the car is more willing to "back into" corners, and this makes it more fun to slide. The Pro-Line tires allow the car to tackle dirt ovals with ease, but Pro-Line's stadium foams would work even better. To install the foams, simply grind the ribs off the stock rims and glue the foams in place.

To give the car a little more ground clearance for the occasional dirt oval, I removed the short spacer from all four shock shafts. While I was at it, I replaced the three-hole pistons with two-holes. This stiffened up the suspension to fight the G-forces common on banked ovals, and it helped to counter the increased body roll that comes with a higher ride height.

With 4WD and a modified motor, I was stuck in the dirt-oval Modified Wedge class at my local track. The 190E didn't have the top speed or the downforce to run with the wedges, but it sure was a blast to throw into turns. With a wedge body, the 190E would handle like a slot car, I'm sure. The point was to have fun and make the 190E more versatile, and, with simple changes, I did both.

TAMIYA HOP-UP OPTIONS

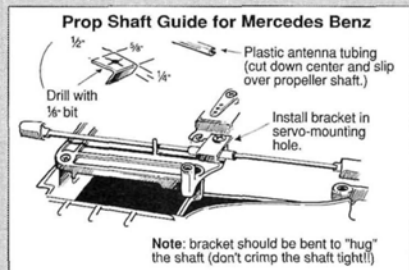
OPTION	PART NUMBER
CVA mini shock-unit set.....	50332
16T/17T AV pinion-gear set.....	50354
18T/19T AV pinion-gear set.....	50355
20T/21T AV pinion-gear set.....	50356
GT-4 front drive-cup and shaft set.....	53030
GT-4 rear drive-cup and shaft set.....	53041
Dynatech 02H motor.....	53044
6513W rotor for the 02H.....	53052
7010W rotor for the 02H.....	53062
1150 sealed-bearing set (4).....	53008
Manta Ray ball-diff set.....	53070
Manta Ray torque-splitter set.....	53071
Manta Ray diff-ball and plate set.....	53072
Manta Ray ball-bearing set.....	53073
Manta Ray stainless-steel propeller-shaft set.....	53079
4WD stainless-steel suspension-shaft set.....	53098
Manta Ray double-deck chassis set.....	53099
3x10mm titanium tapping screws (10).....	53098
Skyline mesh wheel set.....	53107
Skyline racing 5-spoke wheel set.....	53108
Top-Force aluminum pressure-plate set.....	53112
Rubber radial-tire set.....	50417



MORE POWER?!

by STEVE COLLINS

As any R/C enthusiast knows, almost any car can be made better. As Tim Allen would say: "More power!" I have put the Tamiya Benz through some serious testing, and I have improved a few things.



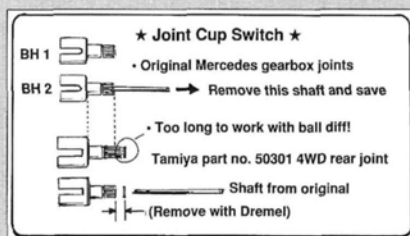
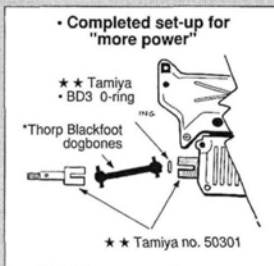
In the quest for better performance, I juiced up the mighty Mercedes with a DuraTrax® Powerline 12-turn motor. Boy, oh boy, this machine was flyin'! Then, the propeller shaft connecting the gearboxes developed a case of the wiggles because of the high rpm and the flexibility of the shaft. To remedy this, I made an aluminum "guide" to contain it. A piece of plastic antenna tubing acts as a bearing. With this combination, the wiggles vanished, and the Benz was a lot more quiet! Remember, don't clamp down on the shaft tightly, or a lot of friction will build up.

After I had beefed up the prop shaft, the dogbones were the next to go. If you look closely, you can see that the rounded ends of the dogbones are made of plastic. Not a plastic coating, but solid plastic. Not too long

after you bolt in that hot motor, you'll notice the weakness of the bones. Improving this serious problem seemed tough at first, because these dogbones are

very short! Then, I got creative. Thorp's® Blackfoot dogbones are the same length, and they fit perfectly into Tamiya Boomerang/Super Shot joint cups (part no. 50301). After I shortened the new tranny cups to fit the ball diff in the rear, everything went together without a hitch.

I've been running these mods since early January without problems, and you can, too! More power!



on the side mirrors and attached the rear airfoil and the front grill. Then, I attached the interior to the body with adhesive-backed Velcro® strips. My efforts didn't live up to the example in the instructions, but the car sure looks good as it blurs past at speed!

DRIVING IMPRESSIONS

Maybe my lack of patience with the decals had something to do with the excitement that was building as driving time neared! From the first punch-off, I was hooked on 4WD! The 190E rips from a standing start

Every time I drive it, it reminds me what the radio-control hobby is all about—fun!

to full speed instantly. Coming out of corners, the Mercedes never hesitates or does anything but accelerate hard and strong. Throttle response with the Speedworks Diamond Gem and Tekin Sport ESC is excellent. Top speed is good for a beginning driver, but a more experienced racer will want more. The trouble is, the 21-tooth pinion gear is the largest the kit will accept, so the only way to gear any higher is to use larger-diameter tires.

With the econo-mod motor, the 190E

(Continued on page 148)

FEATURES

Truck of the Year!

Home-Built
1/4-Scale
Sprinter

More Cheap
Paint Tricks

Florida Winter
Champs

How to Mount
Lexan Bodies

next month

TRACK REPORTS

MRC Desert
Thunder

Kyosho Williams
Renault

DuraTrax
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Big bad buggy

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*Denotes ROAR World Team nationally-held qualifying races

Plus, many regional and local races: Toys for Tots, R/C Speedweek, etc. The fact is that every race entered in '92 by the Associated/Paris team of Ralph Burch, Jr. and Mike Swauger was won with the Picco setup. The Picco Genesis race car is one of the most sophisticated race cars today! Its high-quality aluminum construction ensures consistent performance, even in high- or low-temperature conditions. Our continuing research and development program helps keep Picco drivers out in front! Watch for updates in performance and durability to be released throughout '93. If you race to win, "Picco's the one!" **PLEASE NOTE:** RC250, RC300, RC500 2WD and RC500 4WD cars & parts will still be available from Associated.



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PARIS RACING PRODUCTS
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NOTICE
Car kit comes complete with Paris Spec P-5 engine, manifold, pipe, 3-speed, and solid axle. (Batteries, radio, air-filter, and body not included).



NEWSFLASH!
The 1993 Paris/Palace Station Can Am will include 1/10 scale On-Road Gas Classes!

OFF-ROAD GAS CHAMPS

(Continued from page 104)

second difference between him and Kinwald. Then, with 3 seconds to go, Hodapp stunned the spectators as he flamed out on the straight-away. Luckily for him, he was able to get restarted before he had lost too much time. Kinwald took the checkered flag; he had turned an incredible 37 laps! Following Brian to the line in second place was Hodapp, followed by Lett, Stollo and Doug Von Mosch.

Buggy A-Main

The buggy A-Main started with top qualifier Doug Von Mosch grabbing an early lead, while Mugen drivers Brian Kinwald and Kohji Sanada worked feverishly to get by him. Von Mosch looked good out in the lead, and he was proving to any disbelievers that he was no "flash in the pan." Behind Von Mosch, Kinwald had rolled on his lid, allowing Sanada to slip into second place, but Sanada shortly dropped to the back of the pack with Kinwald. In the early stages, it was Von Mosch, followed by Tohiro Hirao, Chris McElroy, Jamie Booth and J.D. Beckwith.

Von Mosch bobbled and allowed Hirao to slide past into the lead, then Von Mosch went onto his lid, and this gave Hirao a more comfortable lead. Hirao was relentlessly chased

(Continued on page 145)

STOP PAYING TOO MUCH FOR BATTERIES

B & T R/C PRODUCTS

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6 Cell 300+ \$26.00 Ea.
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SANYO RECHARGEABLE "AA"
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SUPPLIES**

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Phoenix 24° 32° 45°
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FANTOM HAND WOUND BUSHING MODS.

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MOTOR BRUSHES

R-12 & R-21
Race Prep "R" & "P"
Trinity Silver
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Battery Claw
Brush Vice
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Air Inducted Bodies

MISCELLANEOUS

Brush Springs
Du-Mor Spur Gears
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14 Gauge Wire
Battery Braid
Shrink "3" Colors
Motor Tubes
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SCOPING OUT

NOVAK 410-M5

by JOHN RIST

IT HAS BEEN quite a while since I looked at the Novak* 410-M5 electronic speed controller (ESC), and Novak has made a few changes, the most noted being the addition of solid-state, reverse-voltage protection (in place of a soldered-fuse link for reverse-voltage protection).

According to its instruction book, the M5 has the same five Megafets as the 410-M1c, and that led me to believe that it would be a mega-hot performer. It also has high-frequency motor control, which permits smooth throttle response throughout the throttle range, longer run times (through the use of a recharging diode) and longer armature and brush life (because there's less arcing and sparking). But would this new, improved version still have all the qualities that make the original one of the top sport ESCs? We'll see!

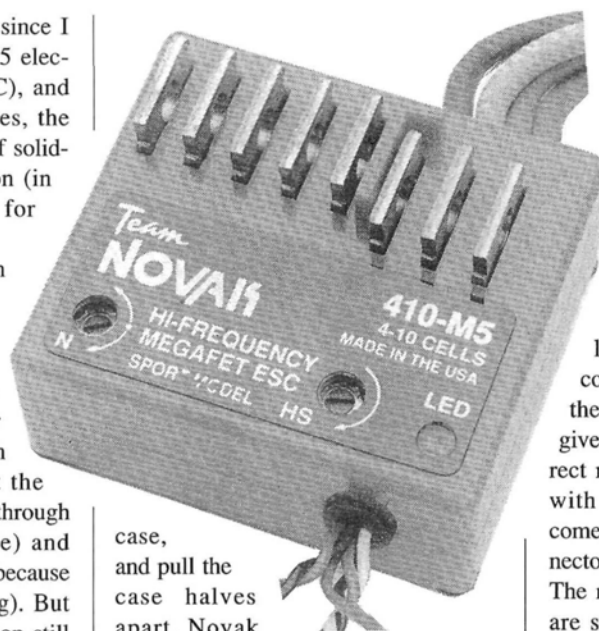
The 410-M5 is a racing-style ESC (forward-only with brakes). In addition to the features already mentioned, it also has:

- five FETs for forward, one for reverse;
- Schottky diode to suppress noise;
- interchangeable receiver plugs that match most radios;
- neutral and full-speed adjustment pots;
- built-in, pulse-checking LED;
- on/off power switch;
- Tamiya-style battery connectors and Associated-style motor connectors.

It comes with an instruction book (excellent for beginners); a screwdriver for adjusting the potentiometers; a heat sink; motor-filter caps; adjustment-hole plugs; double-sided mounting tape; and a hot decal set.

SECOND LOOK

It's easy to look inside; just take the four screws out of the bottom of the



case, and pull the case halves apart. Novak seems to be using the same space-age technology in the M5 sport as they use in the M1c and the HPC pro models. This is probably because with today's expensive, high-speed, robotic assembly techniques, it's sensible to make models as similar as possible to avoid having to re-tool the assembly line. The other force that keeps all the Novak ESCs looking alike is the high cost of developing a custom integrated circuit. It makes good sense to design a chip properly and use it in all your models.

This ESC's "workings" are contained on two printed-circuit boards that have components mounted on both sides. The boards are stacked and then connected with riser wires.

Having noted a strong resemblance between this ESC and the M1c, I checked the instruction book to see what Novak had to say about its performance. Novak compares the two controllers and gives the same current and resistance ratings for both. Novak claims to have built a sport ESC that has the guts of a pro model. I headed

off to my "Scoping Out" lab to see whether this controller would live up to its manufacturer's claims.

INSTRUCTIONS AND SET-UP

Before testing the controller, I read the instruction manual thoroughly. It's one of the best in the industry. It includes an excellent drawing that shows how to connect the 410-M5 with the motor, the battery and the receiver. It also gives details on how to install the correct receiver plug and set up the ESC with all the popular transmitters. It comes with the battery and motor connectors installed, and that's a real help. The neutral and full-speed adjustments are standard, and the pulse-checking LED made setting the M5 to my radio a piece of cake.

RESISTANCE TEST

With 12 amps of current flowing through the 410-M5, I measured a drop of 0.27 volt between the motor and battery connectors—a resistance of 0.0225 ohm. I took the next voltage reading 2 inches along the battery and motor wires and noted a resistance of 0.07 volt—0.0058 ohm. These figures are interesting. First, the connector-to-connector reading shows a power loss that's close to *four times greater* than the voltage loss 2 inches along the wire. As I've written many times, long wires and Tamiya-style connectors will kill the performance of a good speed controller.

LET-IT-COOK TEST

For this test, I install a heat sink, but I don't provide any cooling air. The heat sink fit loosely and was in danger of falling off, so I bent the two outermost fins slightly inward, and that solved the problem.

"SCOPING OUT" LAB AND TESTS

THE LAB consists of:

- an oscilloscope
- a digital voltmeter
- a variable-load resistor bank
- a 6V 30A electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5W power resistors that can be switched on and off one at a time to vary the load between 0.6 amp and 20 amps, but the standard 12 amps are usually used.

In series with the resistors is a 25A Simpson current meter and a 1-percent 0.01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply provides the test current.

• VOLTAGE-DROP TESTS.

These are the first tests. It's virtually impossible to read an ESC's resistance directly, so I measure the voltage drop across it with the resistor bank set up for 12 amps of current. I then calculate the controller's "on" resistance by dividing the measured voltage drop by 12 amps. I take the voltage reading twice: along the full length of the battery and motor wires (including connectors) and 2 inches along them. The first reading helps me to determine an ESC's "on" resistance as it comes from the factory, and the second gives a standard reading with which I compare ESCs.

• LET-IT-COOK TEST.

I adjust the resistor bank to pass 20 amps of current, then I jam the throttle wide open and let the ESC pump the 20 amps.

• DEAD-SHORT TEST.

With this test, I check whether the controller can survive the heavy current caused by a jammed gear or a fried motor. No one likes to have this kind of trouble and discover that his ESC has been destroyed, too.

Novak 410-M5

DIMENSIONS:

Height	0.75 inch
Width	1.4 inches
Length	1.58 inches
Weight with wires	2 ounces

TUNING:

Access to controls	Excellent
Ease of adjustment	Very good

PRICE:

Sug. retail price	\$119
Warranty	90 days

ELECTRICAL:

(Manufacturer's specs)

Max voltage	10 cells
Min voltage	4 cells

Continuous current	250 amps
Resistance	0.003 ohm

TEST PARAMETERS:

Voltage	6 volts
Current	12 amps

Voltage drop along length of wires	0.27 volt
--	-----------

Voltage drop 2 inches along wires	0.07 volt
---	-----------

Calculated resistance:
Voltage drop / current = resistance

Resistance to end of wires	0.0225 ohm
----------------------------------	------------

Resistance 2 inches along wires	0.0058 ohm
---------------------------------------	------------

BEC output, 6-cell battery ...5.69 volts

COMMENTS: if you're looking for a speed controller that has the heart of a pro model and the price of a sport model, the 410-M5 is the one for you. It has the same Megafets as its big brother, the M1c, so it has the same, super-low "on" resistance and current-handling ability. It can easily handle a 7-cell battery pack and a modified motor. It's small and light and should fit into any 1/10- or 1/12-scale vehicle.

With the 410-M5's impressively low "on" resistance, I predicted that it would give this test the "cold shoulder." After passing 20 amps of current through the controller for 15 minutes, the 410-M5's heat sink was warm, but by no means hot enough to hurt. The battery connector, however, burned my finger! Score: one "attaboy" for the 410-M5 and one "ouch" for the connectors!

DEAD-SHORT TEST

During this test, I try to force the controller into thermal shut-down by running a monster-wire short across the motor leads. The current jumped to 40 amps (the limit of my lab's power supply). After a minute, the controller was smoking hot, but it hadn't gone into thermal shut-down.

REVERSE-VOLTAGE TEST

This is where I connect the battery backwards—something I usually try not to do! But Novak says that the M5 has solid-state reverse-voltage protection, so I crossed my fingers and connected the battery pack in reverse. What happened? Absolutely nothing! I re-installed the battery—

properly—and the 410-M5 worked normally—just as a purebred racing ESC should.

ON THE ROAD AGAIN

As usual, I mounted the 410-M5 in my trusty Kyosho Sideways, which has big wheels that can run on grass, dirt and pavement. The controller has a full set of connectors, so it was easy to mount it in the car. The instruction book answered any questions that arose.

I used a 6-cell, 1500mAh SCR battery pack and a Trinity Slot Machine stock motor. Wanting fast and furious fun on grass and pavement, I set the gearing high. The drag of the grass takes a brutal toll on the motor and speed controller; and running in the street in front of my house (dead end; no traffic) allows me to check the radio range and the top-end speed.

From the very first squeeze of the trigger, it was obvious that the 410-M5 is a high-frequency, motor-drive controller. Throttle response is smooth, especially at slow to moderate speeds; and even though my Sideways ran through grass part of the time, run times were good (slight-

(Continued on page 160)

TROUBLESHOOTING

by FRANK MASI

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, Radio Control Car Action, 251 Danbury Road, Wilton, CT 06897. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

SPIN OUT WITHOUT ELVIS?

I have an RC12L that's equipped with a Reedy Super Tru-Stock motor and green front and rear tires. The car always seemed to spin-out during acceleration. I adjusted the tweak, and now it understeers. Once in a while, it still spins out. The problem may be the tires. If it is, then please tell me which types of tire to use. I would really appreciate your help.

Brian Suh, San Jose, CA

It sounds as if you're using the right type of tires; most 1/12-scale race cars are equipped with green-compound tires up front and in the rear. (Whenever I drive at a new track, I start with green-compound

medium-grip tires.

Traction compounds such as those offered by Racer's Choice, Trinity and Paragon can greatly improve an on-road car's handling. First, completely coat the rear tires with the compound (following the manufacturer's instructions), and then drive the car. How did it feel on the track? It probably handled well, in which case you'll simply have to apply the compound to the rear tires before every run. If the car "pushed" too much, apply some traction compound to each front tire. (Ideally, your car should understeer—push—only slightly so that it's easier to drive.) Don't—I repeat don't—coat the entire tire. Coat only the inside third of the tire, and then drive the car to see how it handles. Not enough steering? Apply a little more compound, perhaps enough to coat half the inside of the tire. Repeat these steps until the car handles the way you like it.

To handle well, the car's diff must work smoothly and freely. This is crucial because the diff affects how the car accelerates and turns. Set it so that it just barely slips when the car takes off from a dead stop. If the setting is too tight, the car will spin out.



MOTOR RESUSCITATION

I own a Precision Motor Works Mad Man's Nitro Express motor. The first time I tried it out, it was very fast, and I was happy with it. After a couple of runs, though, it started to slow down. I installed new brushes and added some Trinity motor oil, but it still operates slowly. What should I do?

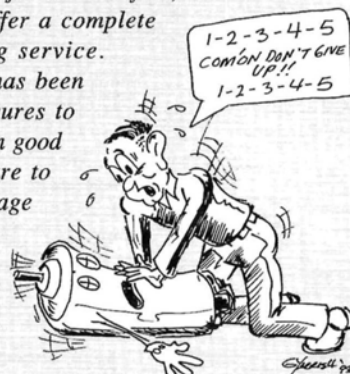
Brian Wurfel, Palmdale, CA

You've taken the right steps to prolong your motor's life (adding new brushes and oiling the bearings), but I fear you've taken them too late. Preventive maintenance is useful only if it's done routinely. Such maintenance includes: changing the brushes before they're severely worn; cleaning the commutator regularly to prevent it from becoming distorted and worn; using a comm stick to remove brush deposits from the comm's surface; and cleaning and lubricating the bearings (or bushings) before they become

irreparably damaged.

It sounds as if your motor needs to be rejuvenated, and that means doing more than just replacing its brushes. To restore that "like-new" performance, have the commutator re-cut. Many shops and tracks offer such services for nominal fees, and some motor manufacturers offer a complete motor-rebuilding service.

Once the comm has been re-cut, take measures to keep your motor in good shape, e.g., be sure to run it at low voltage for a few minutes to seat the brushes properly whenever you replace them.



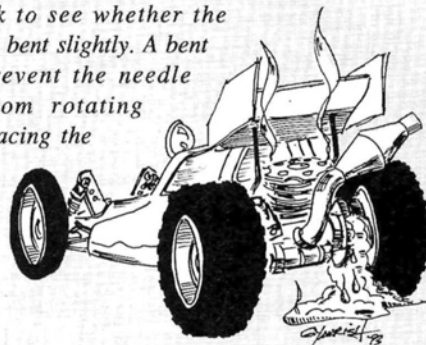
CLUTCH CLUNKER

I'm a newcomer to the R/C world, and I need some advice to get my Burns DX back on the track. The roller bearing in the clutch assembly has literally melted away, leaving only the roller pins behind and causing the entire clutch assembly to jam. This happened once before; the first time, I thought it was just a "novice" error, and I carefully replaced the necessary parts—no luck! I use an O.S. Max .21 RF-B engine and a Futaba Magnum Junior radio with S148 servos.

Gregory Rosenbaum, Johnstown, PA

It's difficult to diagnose your car's malady without actually seeing it, but I can make an educated guess. Something is generating enough friction to cause the bearing race to melt. Perhaps you're using a clutch nut of the wrong size. If

this is the case, the E-clip that secures the clutch bell to the nut is forcing the bell against the needle bearing and causing binding. If this isn't the case, check to see whether the clutch nut is bent slightly. A bent nut will prevent the needle bearing from rotating freely. Replacing the nut should solve the problem.



HOME-STEREO ESC

I own a Yokomo YZ-10 with a Pocket Rocket motor, a Tekin 408 ESC, an Airtronics radio (with the standard servo) and a 6-cell pack. Whenever I run my car, the controller makes a funny beeping noise. Although it doesn't seem to be affecting the car's speed, is there a problem? I didn't notice it until I ran the car very slowly. Does the sound have to do with the high-frequency ESC?

Also, I find it very hard to keep my servo on the chassis, and I don't have room for any nylon mounting blocks.

Finally, the instructions say that there's a servo-saver in the kit, but my friend tells me that I still need to attach one to the steering servo.

Michael Wang, Clarks Summit, PA

Don't worry, Michael, there's nothing wrong with your ESC. The beeping noise is emanating from the motor, not the controller. Motors have the same basic components as audio speakers—a magnet and a coil. As you apply throttle and your ESC switches on and off, it makes the motor—the "speaker"—beep. Although you can't always hear it, this beeping is always present.

You don't need to use mounting blocks to install the steering servo in your YZ-10. Instead, use double-sided tape—what we in the R/C biz refer to as servo tape. Be sure that the servo and the chassis are clean and free of oil. (I wipe down the surfaces of both using a rag sprayed with motor cleaner.) Apply the tape to the entire side of the servo, then carefully attach it to the chassis in the desired location. If you do this correctly, the servo won't ever pop off. In fact, you'll probably have a difficult time removing it to have it serviced!

The YZ-10 has a servo-saver built into its steering bellcranks. If you're accident-prone, however, you might want to attach a servo-saver to the steering servo itself. Kimbrough Products offers servo-savers to fit just about any imaginable servo.



CONNECTOR MELTDOWN

My Traxxas Sledgehammer is equipped with ball bearings, an 18-tooth pinion gear, a Trinity Psychotic Reaction motor, a Dynamite 1500mAh 7-cell hump pack and the stock XL-1 ESC. I'm constantly frying the battery and the motor connectors. Is there a problem with my controller, or does this happen because

the battery pack is too powerful? I plan to purchase a

Novak 410-M1 ESC, but before I put a

more expensive controller in my truck, I'd like to know what's causing my connectors to fry. Please help.

**Ricky Bailey
Currituck, NC**



Your problem isn't really with the ESC; it's with the battery and motor connectors. More than likely, you're using Tamiya-style connectors, which aren't efficient enough to handle the voltage requirements of such a hot motor. (The inefficient transfer of voltage through these connectors generates heat.) To make matters worse, you're using a 7-cell pack—more voltage! These two factors combined have caused your nuclear meltdowns!

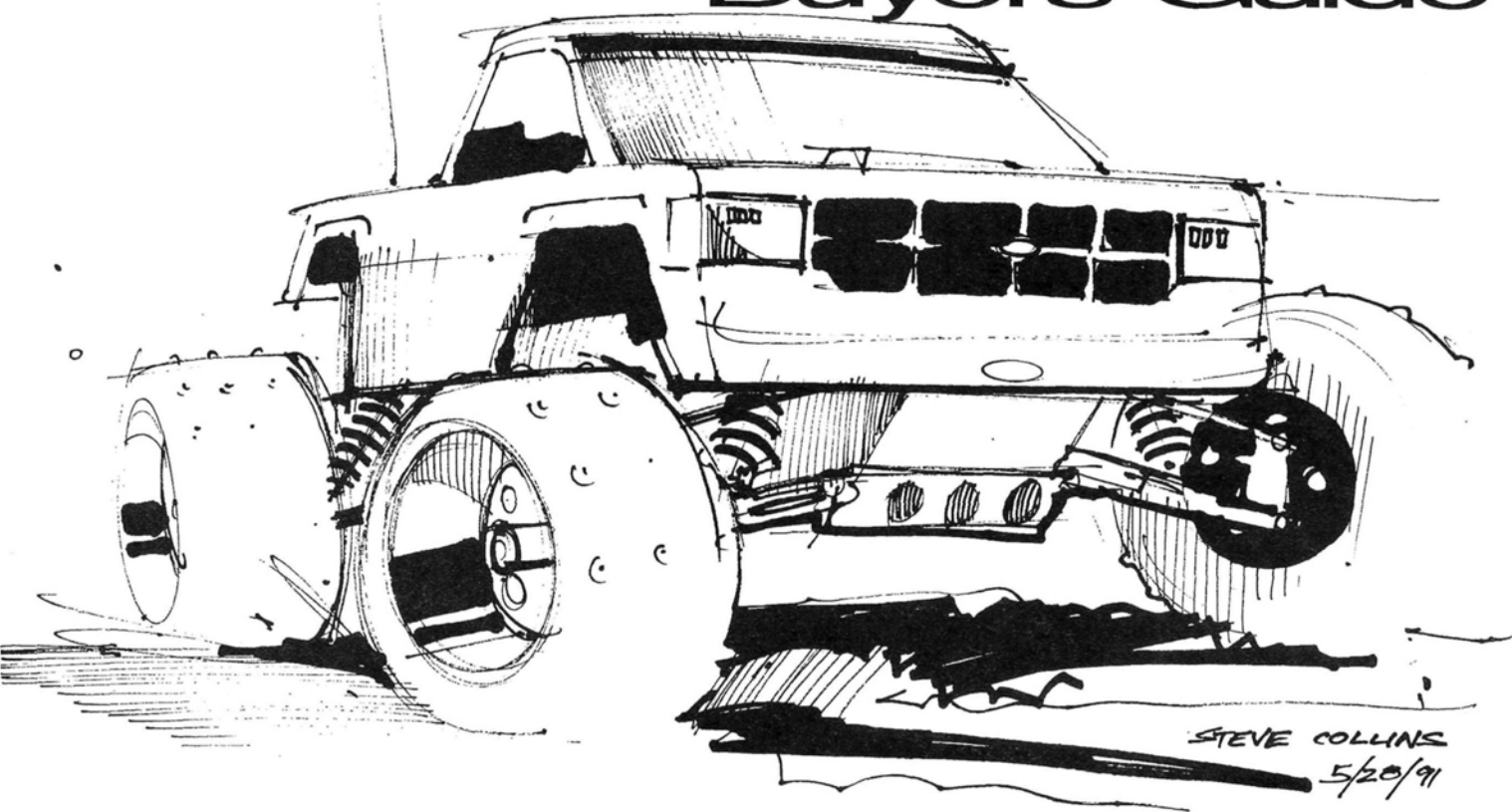
The simplest solution is to replace the battery and motor connectors with those of a higher quality. Deans, Astro Flight, Litespeed, Sermos, Race Prep, Trinity and a host of other companies offer connectors that work almost as efficiently as 14-gauge wire. You're more likely to fry your ESC before these connectors even become warm to the touch.

The XL-1 is a good ESC to start with. To run hot modifieds, however, you should buy a higher-grade ESC. The Novak 410-M1 is more efficient than the XL-1, so you'll be able to maximize your battery's power. In addition, the M1 is a high-frequency unit, and that means that it switches at a much higher rate. You'll find that your run times will be longer and your motor will run cooler.

(Continued on page 144)

RACE TRUCK

Buyers' Guide



R/C race-truck mania is still sweeping the country.

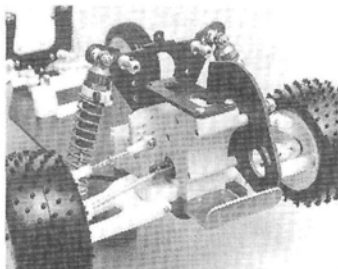
In pursuit of performance and speed, racers seek the hottest after-market goodies, and they're not easily impressed. We present you speed freaks with a guide to some of the hottest stuff available. Keep in mind that all these companies offer lots more goodies—we just don't have the space to print them all here!



B.T.S. Liberator

This new, narrower body for Team Losi's LX-T has an extended cab and durable flared fenders. It's available clear, or painted by G. Booker Paints.

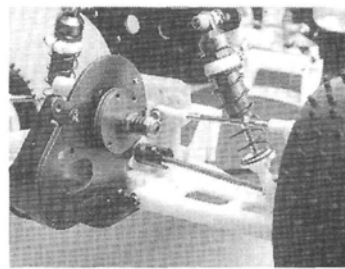
Part nos.—9512 (clear); 9512P (painted); prices: \$17.75; \$49.



Lethal Weapon 2s

These durable, top-of-the-line trannies are for all-out racing. With their efficient belt-drive, they offer longer run times, smoother, faster acceleration and quieter operation. They're available for the LX-T and the Blue Eagle LS (both transmissions come with dogbones and Power Clutch) and for the RC10T (Power Clutch included).

Part nos.—192 (LX-T); 195 (Eagle LS); 196 (RC10T); prices—\$117; \$112; \$102.



Dogbone Conversion Kit/Power Clutch

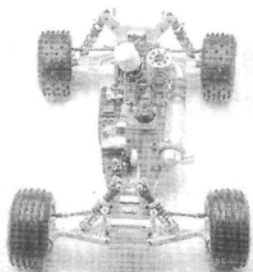
The dogbone conversion kit for the Traxxas Blue Eagle LS allows free suspension movement by eliminating the need for slider shafts, which bind under load. It improves acceleration, handling and stability. Also shown is A&L's Power Clutch for the Blue Eagle LS. It allows smooth, consistent operation, and it also allows gears to be changed easily.

Part nos.—1214 (dogbone conversion kit), 282 (Power Clutch); prices—\$32.95; \$39.95.

RACE TRUCK

Buyers' Guide

A-MAIN



RC10T Nitro Conversion Kit

This is the all-new A-Main Racing Products/Dudgeon Conversion. It's what the Team drivers used to finish first, second and third at the two most recent Kyosho Gas Off-Road Championships. Price: \$250

ASSOCIATED



RC10T Racing Truck Kit

This kit includes the race-winning Stealth tranny, new, improved hard-anodized Teflon-coated gray shocks, new dogbones, new links, narrow and wide front tires, wide front A-arms, a heavy-duty servo-saver, a black aluminum chassis and ball bearings. Part no.—7001; price—\$335.



California Ford Stadium Truck Body

This is Associated's latest racing truck body for the RC10T. Part no.—6169; price—\$18.



Toyota Baja Pickup Body

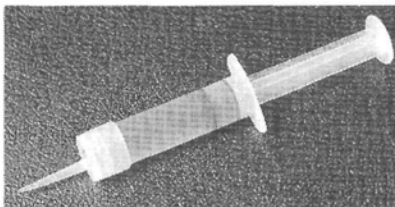
This off-road Toyota Baja truck body is for use on any RC10 that has been converted to a truck. Part no.—6174; price—\$18.

BOCA BEARING



Secret Weapon

Incredibly accurate Secret Weapon bearings are the ones your race truck needs for those final heats. Their "secret"? Among other things, they have extra-close tolerances and they use "high-speed" oil. Prices—\$34.95 to \$36.95



High-Speed Instrument Oil

High-Speed Instrument Oil is now available for truck wheel bearings. Packaged in a 5cc, easy-to-use, sealed syringe, its operating temperature range is -50 to +400 degrees Fahrenheit. Price—\$6.95



Midas Touch Air Power

This state-of-the-art product does more than other lubricants. Midas Touch reacts electro-chemically with the naturally occurring corrosion in truck engines; it fills the pits and gaps to leave a smooth, strong, friction-free surface. Prices—\$5.95 (1 ounce); \$12.95 (4 ounces).

DAHM'S



Commando XL

Dahm's fastback racing truck body for the LX-T sits much lower than the stock body. It also fits the RC10T, the Stadium Blitzler, the Outlaw Rampage and Ultima, and the Blue Eagle LS. Part no.—D198; price—\$19.98.



Buggy

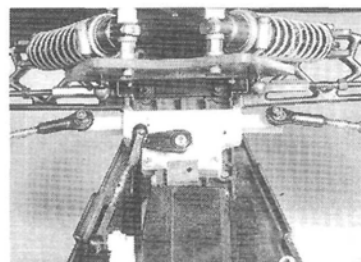
This fastback racing bug body for the RC10T fits so tightly that you can attach the body to the sides of the aluminum tub frame with Velcro®. It comes with mounting instructions for the Stadium Blitzler, Clod Buster, USA-1 and Outlaw Raider. Part no.—D080; price—\$19.98.



Camino 2000

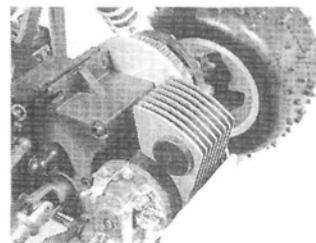
This futuristic El Camino-style racing body is designed to fit most 1/10-scale monster trucks, e.g., the Clod Buster, Blackfoot, Super Blackfoot and Kyosho USA-1. Part no.—D199; price—\$20.98.

HOLESLOT



Rack-and-Pinion Steering

This revolutionary steering unit can be bolted directly onto all Associated and Team Losi trucks and off-road cars. It provides linear steering and, unlike conventional steering units, there's no slop. Part no.—3000; price—\$31.95.



Super Cooler II

This new heat sink has the same high-performance qualities as the Super Cooler 2000. Its fins contain a chamber into which you can put coolants such as dry ice, ice water, antifreeze, etc., but you can also use it without coolant. Part no.—2002; price—\$27.95.

KYOSHO



Outlaw Rampage

The Outlaw Rampage combines 1/10-scale off-road stadium racing and gas power. It comes with a powerful O.S. .12 CZ-R engine with a recoil pull-starter, and the fuel tank and gearbox are already installed. It also has 4W independent suspension and a tough aluminum chassis.

Part no.—KY0C0518; price—\$395.95.



Outlaw Ultima

The Outlaw Ultima has a Kelron chassis, 4W, independent, double-wishbone suspension, pin-spike tires, a Kyosho Super Stock 34 motor and four long shocks with adjustable collars.

Part no.—KY0C0210; price—\$229.95.

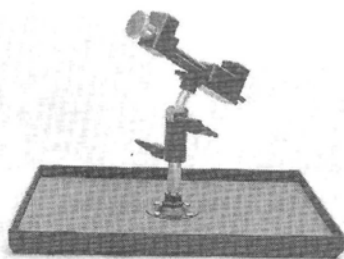


Outlaw Raider

This racing truck is designed especially for beginners. Its features include long, oil-filled shocks with maximum suspension travel for off-road surfaces, a heavy-duty speed controller, large, pin-spike tires and a flexible resin chassis.

Part no.—KY0C0190; price—\$149.95.

LIGHTNING PRODUCTS

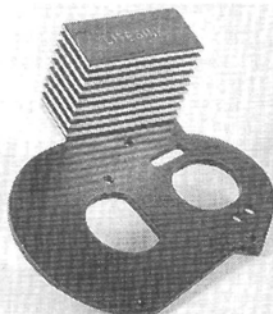


Steady Lift Pro

The durable, heavy-duty Steady Lift Pro and Steady Lift Jr. (not shown) work stands were designed to suit a wide range of R/C trucks and cars, and they securely hold models in scales of up to 1/8. The adjustable clamping device rotates 360 degrees and tilts 180

degrees, and it's mounted offset to make the chassis completely accessible. Part nos.—SLP-1 (Pro); SLJ-1 (Jr.); prices—\$56; \$36.

LITESPEED



RC10T Litesink

Motors cooled with this light, black-anodized Litespeed heat sink run cooler for more race power. Dyno-testing shows it will allow your RC10T and RC10 to run faster and longer.

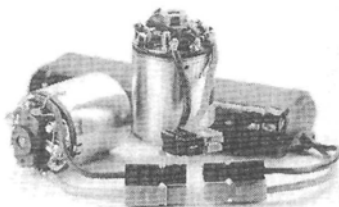
Part no.—1001; price—\$27.95.



JR-XT Litesink

Motors cooled with this light, black-anodized Litespeed motor heat sink produce the most race speed and power and allow your JR-XT or JR-X2 to run faster and longer.

Part no.—1045; price—\$29.95.

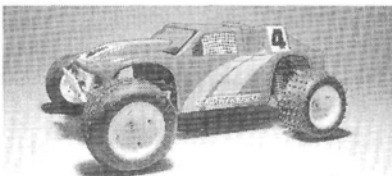


Super-Con Connectors

Genuine Litespeed Super-Con connectors have a lower contact resistance than any others. They're spring-loaded, so they don't loosen with use.

Part nos.—0150 (two pair); 0151 (10 pair); prices—\$3.10; 13.95.

McALLISTER RACING



Dakota T

This hot new body was specially designed to fit the new "T" chassis. It has molded-in number plates, and a sleek hood bubble houses the long shock struts.



'48 Ford

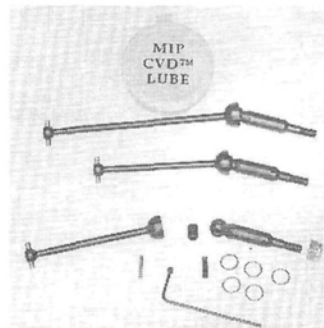
Dick Tracy would be proud. This is the ultimate for street cruising or monster trucking. This '48 Ford Panel will get the looks. Part no.—B145.



Toyota Mini Pickups

McAllister offers the legendary Toyota of Ivan "Ironman" Stewart in a 1/10-scale off-road truck body and desert racer.

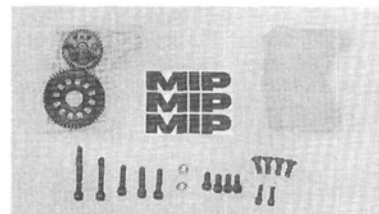
MIP



RC10T Constant Velocity Drives

MIP's Constant Velocity Drives for the RC10T and RC10 are modules. They can be completely rebuilt, and have one-third the measurable output interruptions of common universals and near-zero backlash. Sold in pairs, they last up to six times longer than standard universals or dogbones.

Part nos.—CVD10T (truck); CVD10 (buggy); prices—\$32.50; \$27.50.



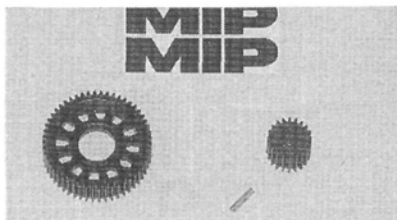
RC10T Change Box

MIP's new Change Box for the RC10T and RC10 is a new option in gear ratios. Use it to convert the Stealth tranny into a 2.61-ratio gearbox for smoother acceleration with less tire spin and smoother deceleration with greater stability and steering. The kit comes with an MIP Tranny Case, diff and idle change gears (gears also available separately).

Part no.—AS-1000; price—\$17.95.

RACE TRUCK

Buyers' Guide



Losi Change Gears

Go from Losi's stock 2.18 gear ratio to MIP's 2.6 gear ratio in just minutes, simply by changing the diff and top gears. With MIP Change Gears, your Losi truck accelerates more smoothly with less tire spin and decelerates more smoothly with greater stability and steering. You'll get a higher output, and your motor will be cooler.

Part no.—L-260; price—\$10.95.

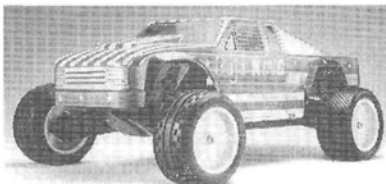
MRC



Thunder King

MRC's World Scale Thunder King features a dual-motor Power Command transmission with an adjustable slipper-clutch, ball differential and motor mount, a ball-bearing gearbox, and a 30-degree front-end rake angle.

Part no.—RX100

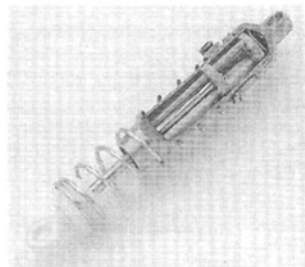


Baja King

Brash graphics, a bold design and superior quality are the features of MRC's World Scale Baja King desert racing truck. It has an adjustable ball differential, Power Command transmission with a slipper clutch, a ball-bearing gearbox and 4W independent suspension.

Part no.—RX103

PARAGON

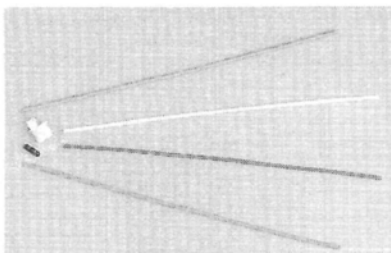


Jump Jets

Jump Jets fit inside your shock to increase its responsiveness over all types of terrain. It

works on the "variflow" principle: a tapered needle passes through a hole in the shock piston. As the shock is compressed, the needle gradually restricts the flow of oil through the piston. This makes the shock stiffer under high loads.

Part no.—JJ625; price—\$7.50/pair.



Nimrods

They're hot. They're wild. They're Nimrods! These fluorescent flexible whip antennas have a great memory. Each package includes four, fluorescent-colored rods with one base and tip.

Part no.—NR090; price—\$5.75.

PRODEUS



Pro-Trim/Body Grommets

Pro-Trim is a flexible, durable edging that virtually eliminates the chance of body splitting and cracking. Pro-Net helps you achieve concours-winning realism. Body grommets are the answer to body splitting and cracking around the body posts. Pro-Trim and Pro-Net come in five hot neon colors and black.

Part nos.—101-106; price—\$9.95.

PRO-LINE



Nissan Stadium Truck Body

Made of durable clear Lexan, Pro-Line's narrow, low-profile, Nissan stadium-truck body offers racing performance and great style. It fits the RC10T, Stadium Blitzter, FXT and all other 1/10-scale trucks.

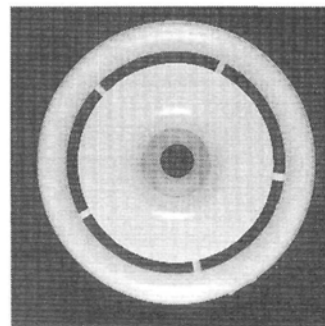
Part no.—3022; price—\$19.95.



Jeep Stadium Truck Body

Made of durable, clear Lexan, Pro-Line's low-profile Jeep stadium truck body fits the RC10T, Stadium Blitzter, FXT and all other 1/10-scale trucks.

Part no.—3021; price—\$19.95.



Truck Stadium Wheels

Pro-Line truck 2.2-inch stadium wheels are available for the RC10T and the LX-T. They come in chrome, too.

Prices—\$7.95; \$9.95 (chrome).

PROTOFORM

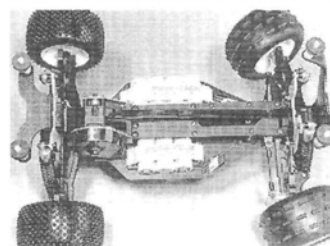


Nevada LX-T

Protoform's first entry in the racing-truck class is based on the hot new '93 Ford Ranger. This Lexan body fits the LX-T like a glove. The rear features a strengthened body-mounting area and add-on spoiler, and the front has a molded-in lower valance to keep dirt out.

Part no.—1506; price—\$19.95.

PURE-TECH



Battery Straps

Complete with mounting blocks, the Pure-Tech off-road battery strap is the perfect replacement for an awkward, heavy battery box. It holds your battery securely and weighs less, and it comes in four neon colors and black.

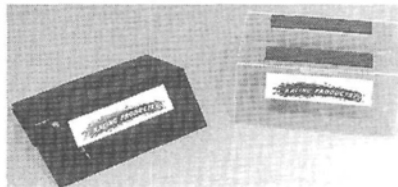
Prices—\$5.99 to \$8.99.



Battery Bars

These light, state-of-the-art copper bars are designed to replace heavy braid or gold-plated battery bars, and they won't reduce voltage or amperage.

Part no.—00034; price—\$4.99/pack of 10.

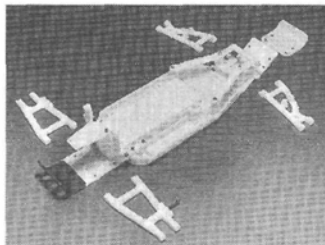


Truck Stand

Use the Pure-Tech truck and car stand to display your vehicle or hold it while you make those last-minute adjustments. Two versions are available: the original one-piece stand and the new folding stand.

Prices—\$7.95 to \$18.95

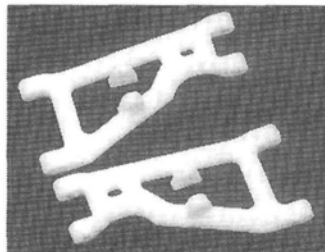
RPM



Ultra Molded Chassis

This bolt-on molded chassis for the RC10T has the same wheelbase, kick and steering geometry as the stock aluminum pan. Made of a plastic-resin composite that has great "memory," this chassis won't bend. The kit comes with a ball-bearing bellcrank, front and rear arms, a mini bumper, a tranny brace, a rear bulkhead and a rear motor-protector plate. It's white and can be dyed.

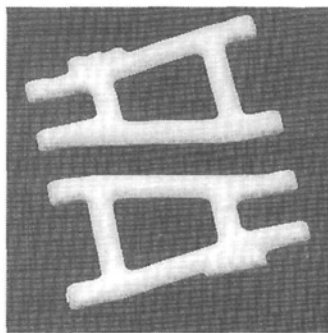
Part no.—8090; price—\$79.95.



RC10T Front Arms

These front arms are of the same length and geometry as the stock Associated arms. They're injection-molded of a tough, dyeable nylon. The aerodynamic, open-rib design won't catch sand and small rocks. RPM also makes front arms for the LX-T.

Part nos.—7040 (RC10T), 7370 (LX-T); price—\$11.95/pair.



RC10T Rear Arms

These arms are direct replacements for the Associated stock arms. The shock-mounting positions are the same distance from the inner arm mount, but slightly higher to allow more down travel and to reduce dogbone binding.

Part no.—7030; price—\$11.95/pair.

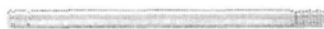


Losi "Tall" Upper Brace

RPM's replacement upper brace for Losi LX-T and Pro SE molded chassis has been raised in the rear to allow a good stiff chassis. You can still use a large servo-saver without cutting away anything.

Part no.—7380; price—\$7.95.

TEAM LOSI



Shock Shafts

Team Losi's shock shafts, known for their strength and performance, are now offered with a titanium nitride finish for smoother performance and longer life.

Part nos.—A-5060 (.6 inch), A-5061 (.9 inch), A-5062 (1.2 inches); price—\$12.95.



LX-T

The LX-T has dominated the truck class at all levels. The kit includes full ball bearings, ultra-long suspension arms made of Losi's advanced "Stiffezel" material for rigidity; "Hard Bodies" hard-anodized shock bodies; competition-grade springs; a friction slipper that's compatible with the Hydra Drive slipper; and an advanced fiber/matrix-resin molded chassis.

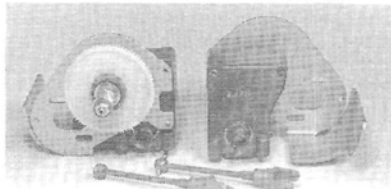
Part no.—A-0055; price—\$329.95.



Junior T

The Junior T is a great entry-level kit. It has many of the features found on other, race-proven, Team Losi vehicles. At the track, it's very competitive, and it can be easily modified and upgraded with parts found on the LX-T. For durability and performance, ball bearings are used throughout the transmission.

Part no.—A-0060; price—\$194.95.



"XX" Tranny

This light, new tranny features the latest composites and high-strength alloys. The lightweight "XX" has a lower center of gravity and a very low drag coefficient, which gives your truck (or buggy) straighter starts, quicker acceleration and longer run times. It's available in 2.61:1 (truck) or 2.19:1 (buggy) final drive ratios.

Part nos.—A-3050 (2.19), A-3051 (2.61); price—\$120.

TRAXXAS



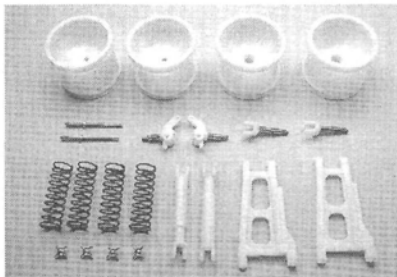
Hawk 2

One of the best-selling entry-level trucks, the Hawk 2 offers the latest technology and proven performance for a low price. It has an efficient racing tranny with an adjustable slipper clutch, 48-pitch gears and a planetary gear diff. The 4W independent suspension, long suspension arms and six oil-filled shocks smooth out the bumps and turns. It's available fully assembled with a radio system and ESC (2906) or with a radio and a mechanical speed controller (no. 2910), and as an unassembled kit with an RS-540S motor and a mechanical speed controller (no. 2901).

Prices—\$190 (2901); \$350 (2906); \$310 (2910).

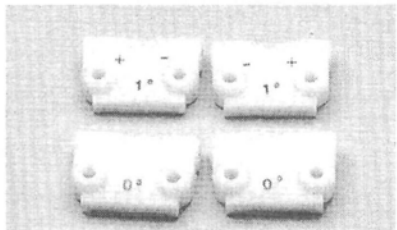
RACE TRUCK

Buyers' Guide



Pro-Series Suspension Kit

This new kit for the Traxxas Blue Eagle, Hawk and Hawk 2 features extra-long rear arms and a special set of light, front and rear dish wheels. The wheels weigh an ounce less than the original kit wheels. Longer, telescopic drive shafts ensure smooth power delivery. The new wheels use shorter axles to minimize the chance of them flexing during a crash. The Blue Eagle LS and LS-2 are already equipped with these parts. Part no.—1930; price—\$25.



Blue Eagle Rear Toe-In Adjustment

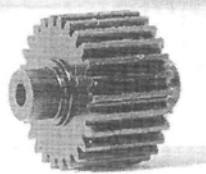
Use these rear suspension-arm mounts to adjust rear toe-in on the Traxxas Blue Eagle. They also increase ground clearance and rear track. The zero-degree blocks don't alter the stock 4 degrees; the ± 1 -degree blocks will either add or subtract 1 degree of toe-in depending upon how they're arranged. Part nos.—2797 (zero degree), 2798 (± 1 degree); price—\$2.

TRINITY



Magic Motorsports Spur Gears

These spur gears allow you to build your gears at home—not at the track. Any standard diff ring snaps into place, so you can put all the balls and lubricant in your diff, snap the other ring into place, and put the gear in your box. They're available in 48- and 64-pitch. Price—\$4.99



Magic Motorsports Zero Gravity Pinions

Zero Gravity hard-anodized pinions are made of 6061 aluminum. Lightened and relieved at all non-stress points for the lowest rotating mass, they have a special narrow tooth web for less drag. They're available in 48- and 64-pitch. Price—\$5.99



Magic Motorsports Layshaft

Magic Motorsports now has new, 30-percent-lighter top shafts for Losi and Associated Stealth transmissions. These shafts are hard-anodized aluminum and have been precision machined for the best possible gear mesh. To go along with the Stealth top shafts, Magic Motorsports also offers precision-machined composite idler gears. Part nos.—MM2004 (Stealth with Hydra slipper); MM2006 (Losi tranny with Hydra slipper); MM2008 (idler gear for Stealth); price—\$22.50; \$22.50; \$10.50.

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TROUBLESHOOTING

(Continued from page 129)



DROP-KICKIN' THE CAR

I bought a Novak 410-M5 ESC for my JRX-Pro SE. After a few minutes of driving, the car stops. If I pick its back end up a little and drop it, the car runs again. Can you please help?

Shane Elliot
Oakely, CA

It sounds like your problem lies with the motor. The next time you run the car and it stops, check that the steering servo works. If it does, then you'll know that the radio gear is receiving power from the battery, so the motor is the most likely culprit.

Examine the motor, especially the brush and brush hood area of its endbell. For a motor to work properly, its brushes must contact the commutator properly. If a brush becomes stuck in its hood, or its spring doesn't apply enough pressure, it may no longer be contacting the comm, and this will cause the motor to stop running. Take the motor out, and remove its brush springs. Work the brushes in and out of their hoods. If they don't move freely, the hoods could be bent, or there could be some debris inside them that causes them to bind. If the hoods are bent, use a flat-bladed screwdriver to gently bend them back—a little at a time—until the brushes move freely again. If the hoods are severely deformed, replace them with hoods from a similar motor. Remove any debris by spraying the hoods with motor spray. Examine the brushes before you re-install them. If they're cracked or severely worn, replace them. Also, check that the brush springs have the tension necessary to push the brushes toward the comm.

If my suggestions don't work, try replacing your battery pack and motor connectors. Check the receiver crystal to see whether it's cracked, and give your on/off switch a close inspection. ■

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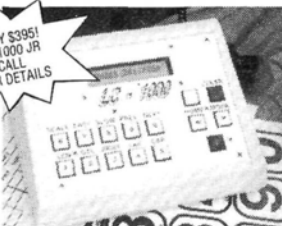
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OFF-ROAD GAS CHAMPS

(Continued from page 120)

by Chris McElroy, while Team Kyosho's Kanai tried to charge to the front of the pack. But as Kanai came around to pit, Beckwith and Kinwald slipped past him. Hirao and McElroy battled back and forth, and McElroy finally passed him for the lead.

In the meantime, Kanai had worked his way back toward the front, and the order was McElroy, Hirao, Kanai and Beckwith. On the next lap, though, Kanai slipped up and Beckwith got around him. Not being content with third, Beckwith charged up to second and bumped Hirao into third. At this point, Beckwith and Sanada were the two fastest cars on the track.

A few laps later, Beckwith and Hirao got around McElroy as he came in to pit. Hirao inherited the lead, but he ended up on his lid and then flamed out. This is when it started to get slightly confusing. Sanada flamed out, and a turn marshal started to run his car back to the pits. That's a big no-no! Your pit people have to get your car where it stopped. So Sanada was asked for a 10-second stop-and-go as a penalty, but he didn't stop. The race announcer warned Sanada that if he didn't stop for the penalty, he would be black-flagged. After a few seconds, everyone

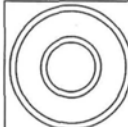
(Continued on page 148)

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CAR ACTION

PIRATE STEALS THE SHOW

Pirating Pays Off Big for Chris McElroy

With the big West Coast Gas Championship only 3 weeks away, Chris had no car, no experience and hardly a prayer of winning. Until he bought a Pirate.

In the kit, he found out why the Pirate is such a value. Steel helical gears in bulletproof tranny's handle the wildest horsepower. Hard coat shocks stay smoother longer. A dual brake system stops quicker. In fact, except for a graphite chassis stiffener, radio tray and a one-way diff, Chris built his Pirate exactly like the box top.

Outnumbered But Not Outclassed

Qualifying showed everyone that with the right car, it's possible that a competitive electric racer can be a competitive gas racer... the first time out. Missing TQ by a scant four tenths of a second, Chris was in the hunt.

The A-Main was packed with many of the best team gas drivers from around the world.

In the 30-minute race, Chris stayed with the pack for the first half, then broke out to win by over a lap.



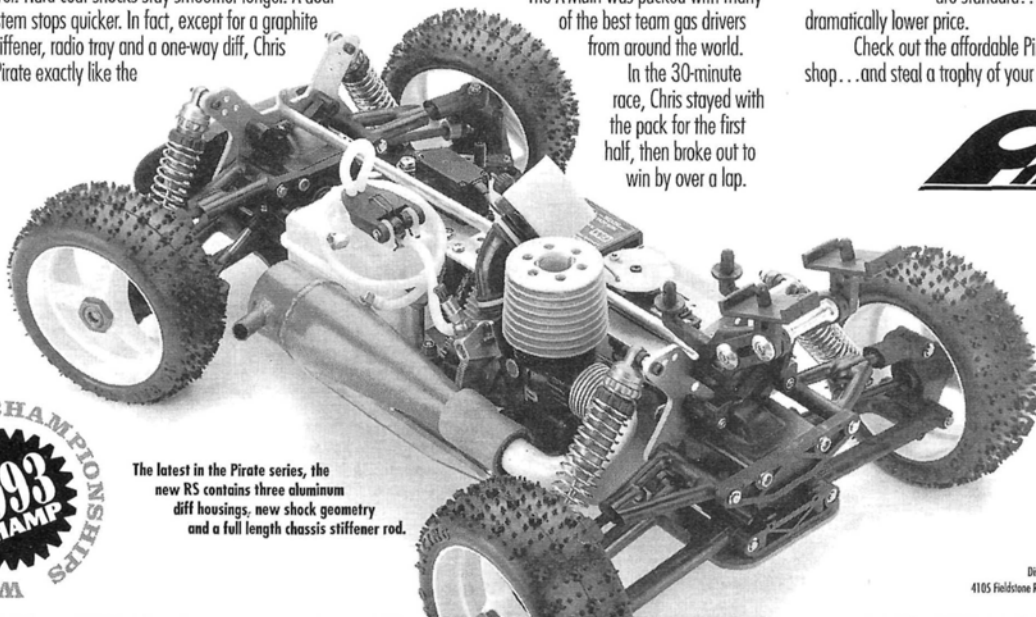
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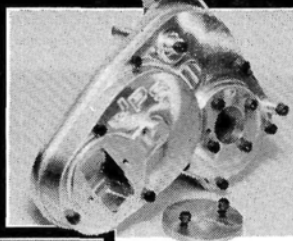
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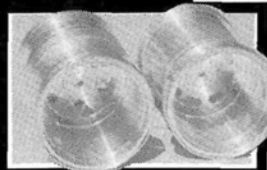
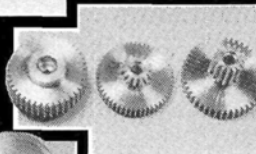
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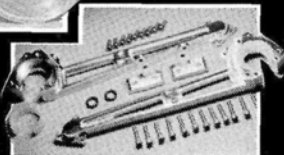
• Steering Axle
Tubes #7060

• Clod Steel
Gear Set
7050



• Single and
Dually Clod
Rims
SOLD IN PAIRS

• Aluminum
Ladder Bars
#7070



MADE IN U.S.A.

OFF-ROAD GAS CHAMPS

(Continued from page 145)

remembered that Sanada didn't speak English and had no idea what was going on. Finally, someone helped him out, and he stopped for the penalty and went on his way.

In the midst of all this confusion, McElroy jumped back into the lead. Then another confusing incident happened. When J.D. Beckwith came around the pit-lane area, he accidentally went into the pits backward. That's another big no-no! So J.D. was asked to stop for a 10-second penalty, but he stopped for only 5. So, on the next lap, he was asked once again to stop and finish out his penalty. That little incident might have cost J.D. the race. When he finally got going again, he was relegated to sixth position overall.

During that incident, Booth, Swauger and Kanai moved to the front of the pack. Almost everyone had made their last pit stop, so it was a race to the finish. McElroy had an 11-second advantage over second-place Kinwald, and, with only 3 minutes to go, six cars were on the same lap. At the end, McElroy finished first, followed by Kinwald, Swauger, Booth, and Beckwith.

Congratulations to Chris McElroy and Brian Kinwald for their great performances in the A-Main. I had a great time at this race, and I can't wait until the next one comes around. The next stop on the gas-attack tour will be in Atlanta, GA, on the weekend of April 30 to May 2nd. Maybe I'll see you there!

TAMIYA MERCEDES

(Continued from page 117)

AMG is a thrill to pitch into corners! It actually lifts the inside rear tire under full-lock steering and full braking—just like the full-size car—but all four wheels hook up and pull the car through the tightest corners at full throttle. It absolutely refuses to spin out or understeer. I could get the Benz to oversteer (push) in corners, but only if I drove like a complete bonehead. The car is incredibly "planted" and responsive!

I'm really surprised at how well the car drives, because I'm used to the compromises that come with setting up an off-road car. Because camber is so important to handling, I thought that the kit's non-adjustable camber arms would be a hindrance. My fears were unfounded, however, because the Mercedes really hugs the road in every situation, and it's an absolute blast to drive. I have fun every time I take it down to the local mall for a private Gymkana session. When I pitch it into a turn, I can almost feel the G-forces

(Continued on page 160)



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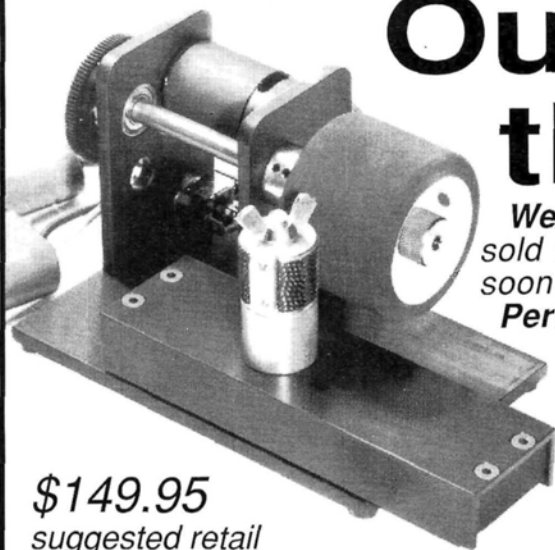
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TAMIYA MERCEDES

(Continued from page 148)

that pinned me to the door of my dad's sports car.

I'm amazed with the Tamiya Mercedes Benz 190E EVO. II AMG. It was fun to build, and it's a gas to drive. The detailed body looks sharp, and the price makes the kit a bargain. Every time I drive it, it reminds me what the radio-control hobby is all about—fun!

**Here are the addresses of the companies mentioned in this article:*

Tamiya America Inc., 2 Orion, Aliso Viejo, CA 92656.
Traxxas Corp., 12150 Shiloh Rd., #120, Dallas, TX 75228.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

LDM Industries, P.O. Box 292396, Tampa, FL 33687-2396.

Tekin Electronics, 940 Calle Negocio, #140, San Clemente, CA 92673.

Trinity Products, 1901 E. Linden Ave., #8, Linden, NJ 07036.

Speedworks; distributed by Trinity.

Pro-Line USA, P.O. Box 456, Beaumont, CA 92223.

DuraTrax; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826.

Thorp Mfg., 4054 E. Mission Blvd., Pomona, CA 91766. ■

SCOPING OUT

(Continued from page 126)

ly more than 4 minutes). The brakes were strong, and there were no glitches, even at long range.

After the first run, the battery and motor were quite warm, but the ESC was only barely warm—enough to show it had been involved in the test. The motor was too hot to touch comfortably.

My results verified that the 410-M5 and the 410-M1c have identical "on" resistance and current ratings. So here's a controller with the innards of a pro model and the price of a sport model. The only problem is its connectors (which rob your motor of much more power than the controller itself does) and the slightly thinner battery wires and motor wires (the 410-M1c has thicker wires). You can solve this problem by replacing the connectors with high-performance connectors such as Litespeed's* Power Pole connectors. If you do this, though, you'll void the 90-day warranty,

so it might be wise to wait until the warranty has expired before you make any modifications.

If you're into racing and need a controller that can run with the best, but you don't have the funds to buy a pro racing model, check out the 410-M5.

If you don't race, but are looking for a reasonably priced, sport ESC to replace that pesky, burned-out, mechanical one, the 410-M5 is a perfect choice. Even backyard throttle jammers need a bulletproof performer that keeps its cool.

**Here are the addresses of the companies mentioned in this article:*

Novak Electronics Inc., 18910 Teller Ave., Irvine, CA 92715.

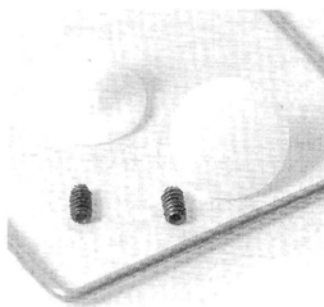
Litespeed, P.O. Box 4765, Spokane, WA 99202. ■



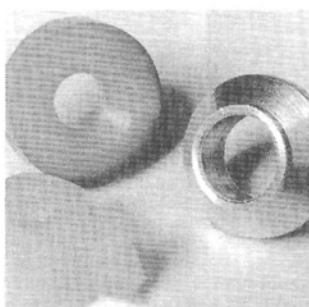
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LETTERS

(Continued from page 9)

ICONO-CLASH

I would like to start out by saying that I found your Editorial in the May '93 issue of *R/C Car Action* hilarious. Of course, when I first read it, I had no idea what you were talking about in the third paragraph. You see, still being a novice, I had no clue as to what negative and positive camber were. I also didn't know what toe-in was, but with a little help from my racing buddies at Queens Off-Roaders and some help from your "Hot Tech Tips from *R/C Car Action*" supplement (my new bible), I soon understood what all those terms were. I can also completely sympathize with what you were saying—no perplexity here.

After I finished reading your Editorial for the third time, I noticed a small black box at the end of it, signifying that well, the Editorial had ended. I also noticed that one of the icons appeared at the end of every article. Thinking little of it, I continued on with my life. Then, about 5 minutes ago, after I finished reading an article from *Black Belt* magazine, I noticed that, at the end of every one of their articles, a small black belt icon appeared, signifying the end of that article. I went on with my life until about 1 minute ago it hit me: *Black Belt* magazine, black belt; *R/C Car Action* magazine, black square?! No! *R/C Car Action* magazine, R/C car? Yes! So, I took the liberty of sketching an R/C car insignia that you might want to use as replacement for your black square. Of course, you wouldn't want to use *that* one—it's too asymmetrical; but it's just an idea.

DAN LUX
New York, NY

Dan, um...how can I put this...we didn't really have so much of a problem with the symmetry. It was more the scale that was a little off...by about 3,000 percent. But hey, keep working on it.

LA

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